PETRUS CAMPER.

THE

WORKS

OF THE LATE

PROFESSOR CAMPER,

ON THE CONNEXION BETWEEN

The Science of Anatomy

AND

THE ARTS OF DRAWING, PAINTING, STATUARY,

&c. &c.

IN TWO BOOKS.

CONTAINING

A TREATISE ON THE NATURAL DIFFERENCE OF FEATURES IN PERSONS OF DIFFERENT COUNTRIES AND PERIODS OF LIFE; AND ON BEAUTY,

AS EXHIBITED IN ANCIENT SCULPTURE;

WITH A NEW METHOD OF SKETCHING HEADS, NATIONAL FEATURES, AND PORTRAITS OF INDIVIDUALS, WITH ACCURACY, &c. &c.

ILLUSTRATED WITH

SEVENTEEN PLATES,

EXPLANATORY OF THE PROFESSOR'S LEADING PRINCIPLES.

A NEW EDITION.——BY T. COGAN, M.D.

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1821.

PREFACE,

By the Tranſlator.

THAT an intimate connexion ſubſiſts between the different branches of the Arts and Sciences, by virtue of which the one elucidates or reflects a luſtre upon the other, is a truth that has never been litigated. The Artiſt, whoſe attention is ſolely confined to one particular object, and whoſe knowledge is as circumſcribed as his employment, may become expert in the mechanic, or operative part of his occupation, but we are not to expect from him any conſiderable improvements, or peculiar indications of taſte; nor will he be qualified to propoſe rules, by which others might be taught to excel.

To none of the fine arts are thoſe obſervations more applicable than to thoſe of Painting and Sculpture; for

none require a larger compaſs of knowledge, or a deeper inſight into Nature, if the Artiſt means to carry the profeſſion farther than the mechanic delineation of an object that is immediately before him.

As the Painter or Statuary, who has made the human figure the peculiar object of his ſtudy, has doubtleſs given the preference to the moſt intereſting and the moſt ſublime department; ſo it muſt be confeſſed, that he has choſen the moſt difficult and comprehenſive. This branch demands great extent of hiſtorical knowledge, an intimate acquaintance with national characteriſtics, great attention to the diverſities occaſioned by progreſſive years and peculiarities of ſex, obſervance of the effects produced by the paſſions upon the human frame, in their various combinations and different degrees of force; ſuperadded to ſuch a knowledge of Anatomy as ſhall enable him to delineate the general ſituation of the muſcles in a placid and inert ſtate, their action in varied poſitions, and their influence in deſcribing every emotion or paſſion of the mind. It is alſo the branch moſt expoſed to the ſeverity of criticiſm; as groſſer faults in the repreſentation of the human form are readily detected, and as numbers, preſuming that they have a complete model

in their own perſons, or competent knowledge from their intercourſe with their ſpecies, affect the refined connoiſſeur, and attempt to ſupport the character by ſearching for minuter blemiſhes.

The delineation of different animals does not require an equal extent and variety of knowledge; and thoſe who have made this branch their principal ſtudy, have in general confined themſelves to cloſe imitation; yet the ill ſucceſs of many painters in this department, the few maſters comparatively who have acquired celebrity, and the very few whoſe works are exempt from groſs imperfections, too clearly indicate that there are latent difficulties, which it is not in the power of mere imitation to ſurmount; and alſo that the addreſs acquired ſimply by attention and practice in the delineation of one particular ſpecies, has rather been an impediment than an aid, in attempts to delineate animals of any other ſpecies.

Much pains have been taken to remove thoſe various difficulties. Men of ſtudy and of genius have attempted to introduce certain principles, and to propoſe invariable rules,

which they deemed conducive to the improvement of taſte in the higher branches of painting, and preciſion in all. Some of the principles advanced, and methods recommended, have been of conſiderable ſervice; while others, as they were built upon falſe dogmas, are more calculated to miſlead than to direct into the right path.

The Work, which is now introduced to the Engliſh reader, profeſſes to remove ſeveral remaining difficulties of no ſmall moment; and to propoſe rules more conducive to facility, grace, and accuracy, than any hitherto offered. Theſe profeſſions are founded upon the diſcovery of a much more immediate and intimate connexion between the ſciences of human and comparative anatomy, and of the natural hiſtory of animals, with the art of delineation, than could have been ſuppoſed to exiſt. Every idea in it, that is peculiar to the Author, exemplifies in a very ſtriking manner the truth of our remark concerning the connexion that ſubſiſts between different branches of the arts and ſciences; by means of which the one may be rendered, in various reſpects, ſubſervient to the other. The happy union, in the ſame perſon, of profound knowledge in Anatomy, with a taſte for Draw-

ing, has demonſtrated that the *minutiæ* of anatomical knowledge are much more conducive to elegance, character, expreſſion, and preciſion, than could poſſibly have been imagined by any one totally ignorant of, or but ſuperficially acquainted with, the ſcience. Whenever the attention of artiſts has been directed to anatomical inſtructions, it has hitherto been confined to the firſt ſeries of muſcles, or their operation in the different actions or poſitions of the body, as marked through the integuments; but we now perceive the great importance of *Oſteology*, particularly an intimate knowledge of the bones conſtituting the cranium, and of their relative ſituations in the delineation of national characters, and in the changes made by advancing age; and alſo its uſes in the production of ideal beauty, or in marking the peculiarities which characteriſe individuals. *Neurology* alſo, which has not been conſidered as having the moſt diſtant relation to the ſubject, is proved to be of high utility in the repreſentation of the emotions of the mind: an attainment confeſſedly the moſt difficult, as well as the moſt intereſting and ſublime.

The *acumen* with which profeſſor Camper has criticiſed

the labours of the moſt diſtinguiſhed painters and delineators of animals; the detection of their errors, and the cauſes of them; the rules given to avoid theſe errors, and acquire greater preciſion in delineating animals of different ſpecies, founded upon comparative anatomy, and the natural hiſtory of the animal, indicate no leſs forcibly the great advantages to be derived by theſe two ſciences, which, united, promiſe to point out an unerring road to excellence.

The Introductory Diſcourſe will acquaint the reader with the methods by which theſe diſcoveries were made. It will alſo make him acquainted, in a pleaſing and ſatisfactory manner, with the progreſſive hiſtory of an inquiſitive mind, from early years up to manhood; the diſſatisfaction that accompanied increaſed penetration and an improved taſte, at the imperfections with which ſome modern productions of celebrated maſters were chargeable; the means purſued to avoid ſimilar imperfections, and to imitate thoſe excellencies in the works of the antients which are the ſubjects of univerſal admiration, though the cauſes of this admiration had never been inveſtigated. The reader will further notice, that the principles advanced are not the premature fruits of

a warm imagination; but that they were gradually formed by the obſervations and experience of a ſeries of years, until they became the baſis of ſound criticiſm, and furniſhed rules for accurate execution. It may not be impertinent to add, that the Profeſſor's remarkable proficiency in drawing, though it was ſimply the amuſement of his leiſure moments, corroborates all that has been advanced concerning the ſuperiority of his methods to thoſe in common uſe. Of this proficiency the connoiſſeur may form ſome judgment from the ſpecimens before him, which are faithful as well as elegant copies of engravings from original drawings; the greater part of which were executed under the inſpection of the Profeſſor, and all of them by the firſt artiſt in the Seven Provinces. By this application of his profeſſional knowledge to his favourite amuſement, he had acquired ſuch a facility and firmneſs in delineation, as aſtoniſhed every attendant on his public Lectures; and artiſts themſelves have acknowledged, that his occaſional and extemporaneous ſketches, exceeded in taſte and accuracy their laboured productions.

The Firſt Book of this Work contains the ſubſtance of ſeveral Lectures, which were read at different times, and

diſtant periods, before the Academy of Drawing, eſtabliſhed at Amſterdam. Theſe were afterwards reviſed and digeſted into a regular Eſſay, and carefully prepared for publication by profeſſor Camper himſelf. It may, perhaps, be thought by thoſe who admit the truth and importance of his leading principles, that the diſtinctions given in the firſt chapter concerning the characteriſtic differences of different nations, are too general, and not ſufficiently adapted to aſſiſt the painter in deſcribing that vaſt variety of national diſtinctions obſervable in the different inhabitants of our globe. But we are to recollect, that thoſe are propoſed ſimply as ſpecimens of a new ſtudy, the proſecution of which would promiſe the greateſt advantages to the national and hiſtorical Painter. The grand object was to ſhew, that national differences may be reduced to rules; of which the different directions of the facial line form a fundamental norma or canon;—that theſe directions and inclinations are always accompanied by correſpondent form, ſize, and poſition of other parts of the cranium, the knowledge of which will prevent the Artiſt from blending the features of different nations in the ſame individual, and enable him to give that true character to national figures introduced into a compoſition, which has always been felt

as a beauty, and the want of it as a defect, though the cauſe has lain concealed. This ſubject may juſtly be conſidered as a new and intereſting ſtudy in the natural hiſtory of man, which requires the joint labours of phyſiologiſts to ſurmount all the difficulties attending it. It is alone by forming a very large collection of the craniums of different people, that a diſcrimination can be made between what is general, from what is merely accidental; what is perſonal and to be aſcribed to the diverſities obſervable in individuals, from that which is national and characteriſtic of a particular people *.

The other articles, minutely treated in this Book, relative to a new manner of drawing portraits in profile, according to certain rules deduced from the conformation of the cranium, and the changes made by age, being founded upon indubitable

* Profeſſor Blumenbach of Gottingen, is purſuing this ſtudy with great aſſiduity. He has already publiſhed two *Decades* of differences in the craniums of different people. The tranſlator has only been able to procure the firſt; from which he learns, that the ſpecimens in the poſſeſſion of this Profeſſor, led him, in ſome few inſtances, to differ from profeſſor Camper, reſpecting characteriſtic marks. As each has formed his opinion from the ſpecimens in his poſſeſſion, thoſe differences manifeſt the difficulties hinted above, and prove that further inveſtigations alone will enable us to diſtinguiſh between accidental forms and *national* marks.

principles, cannot be ſubject to ſimilar incertitude; ſo that reſpecting theſe, every Student has the means of making great improvement completely in his power. The great utility of the remarks concerning the beauties of the antients will be ſelf-apparent.

The Contents of our Second Book are the ſmall remains of Lectures upon other ſubjects relative to drawing; the ideas of which ſuggeſted themſelves, while the Profeſſor was engaged in the purſuit of his firſt object. They were collected from imperfect manuſcripts and detached hints, found among the Profeſſor's papers after his deceaſe, and publiſhed by his Son in as complete a manner as circumſtances would allow. Of conſequence they are merely to be conſidered as Notes and Heads of Lectures, the ſubſtance of which was given extempore. This will ſufficiently explain the reaſon why the ſcientific introductions appear ſo diſproportionate to the explanatory parts. It muſt alſo be noticed, that at the time theſe Lectures were delivered, the audience enjoyed the great advantage of ſeeing every part of the ſubject explained, by a great variety of extemporaneous ſketches, which were ſucceſſively effaced from the board to make room for others.

Thoſe communicated to the Public, are the only ones to which the Profeſſor had given permanency; and of theſe the ſketches, illuſtrative of the paſſions, were too imperfect to be given as they were found; the engraver was obliged to ſupply ſome ſtrokes that had been omitted. All the other drawings were ſufficiently accurate not to require additions or alterations. We are informed that profeſſor Camper had it in contemplation to extend the ſubjects much farther, arrange his ideas with more accuracy, form each Lecture into a diſtinct treatiſe, and illuſtrate the poſitions advanced by a regular ſeries of drawings. But upon receſs from the academy at *Franiker*, public affairs engaged his immediate attention during the political troubles in Holland, until death terminated every ſublunary purſuit *.

Although, from the above cauſes, the Lectures on the manner of delineating the different paſſions, and on the points of ſimilarity between Quadrupeds, Birds, and Fiſhes, founded upon this ſimilarity, are neceſſarily imperfect, and have a claim to the indulgence due to fragments and rough ſketches; yet they may be deemed a valuable acquiſition to

* Profeſſor Camper died at the Hague, in the year 1789.

the Painter. They abound with ſound criticiſm, and furniſh hints which promiſe peculiar advantage to the delineator of the human paſſions, or of objects in the animal kingdom; and they will greatly aſſiſt the connoiſſeur in judging of the accuracy and merits of a performance in this department of Painting. In a word, the principles and hints advanced, contain valuable germs, the development of which promiſes an abundance of rich fruit to the intelligent Artiſt.

It was the celebrity of theſe Lectures in Holland that made them attract the Tranſlator's notice; and a conviction of the truth and great utility of the principles advanced in them, made him wiſh that the artiſts and connoiſſeurs in Great Britain ſhould enjoy the advantages to be derived from them. But he had every reaſon to apprehend, that they would remain deprived of theſe, unleſs the Work was undertaken by himſelf. To a competent acquaintance with both languages, the knowledge of anatomy was alſo neceſſary for the tranſlation of a Treatiſe of this kind; and through the preſumption that every other perſon in the Seven Provinces, poſſeſſing theſe requiſites, might be engaged in more important employments, or be deſtitute of leiſure, he has impoſed

the taſk upon himſelf. He has been induced by theſe conſiderations to ſubmit to a labour which has not been very agreeable. To *tranſlate* has always appeared to him like treading, with ſlow and tedious pace, over another man's ground, after the eye has been ſatisfied with the proſpect, and with looking at every object compoſing it. But in this buſineſs he had to work his way through a very intricate ſubject, an involved ſtile (for the Profeſſor's pen is by no means equal to his pencil) and through the ſtill greater difficulty of an erroneous edition, where the very numerous faults in the references preſented perpetual embarraſſments. He claims to himſelf ſome degree of merit, from this inſtance of ſelf-denial, and urges it as a plea for indulgence to any incidental errors, from which it is ſcarcely poſſible for a work of this kind to be totally exempt.

Great attention has been paid to perſpicuity, and every idea peculiar to the Author has been faithfully rendered; but the Tranſlator has thought himſelf at liberty to make ſome deviations of a trivial nature, in order to accommodate the work to the Engliſh reader; of which the following are the principal:

Paraphraſtical or explanatory deſcriptions are ſometimes added, particularly in the references to the five firſt Plates of the Firſt Book. The Profeſſor had uniformly confined himſelf to the conciſe algebraic mode; but this conciſeneſs, and a ſcientific appearance, were frequently purchaſed by the loſs of perſpicuity and painful abſtractions. Explanations are therefore ſubjoined, until the reader, familiarized with the ſubject and with the figures, will no longer require them.

In the Lectures, that complimentary ſtile which the Dutch literati ſtill retain in all their public harangues, particularly in the exordium and at the cloſe, is conſiderably retrenched; as it would be diſpleaſing to an Engliſh ear accuſtomed to greater ſimplicity.

The two firſt Lectures are, in the tranſlation, compriſed in one, ſince they related to the ſame ſubject. As they were delivered, they were of the uſual length; but from the cauſes already mentioned, they were rendered too conciſe in the publication to require a ſeparation.

In the tranſlation, two publications given at different

periods, are contracted into one volume, not much larger than either of the original volumes. This has been effectuated by the rejection of an Eſſay on the Principles of Beauty, which contained the ſubſtance of three Lectures, which had alſo been read before the Academy, and which the Editor had ſubjoined to his ſecond volume. This Eſſay would not have conveyed the ſame information to the Engliſh reader it might have done to the audience, as Mr. Camper had profeſſedly adopted the theory of Mr. Burke; with which we may ſuppoſe every Engliſhman of taſte to be familiar. Although it diſplays conſiderable erudition, yet this is moſtly employed to exemplify the ſentiments advanced in the Chapter on Beauty. The Tranſlator was therefore unwilling to deſtroy the uniformity of a Work entirely of a Practical Nature, and replete with Important Rules, by ſubjoining ſpeculations which had no immediate relation to practice, and which would have appeared defective to every one who has read the Treatiſe of Mr. Burke, or the more recent publication of the Rev. Mr. Aliſon.

The ſubject of the Notes will ſufficiently ſhew, whether they were by the Profeſſor or his Editors, excepting the one

in the 169th page. Should the remark it contains be impertinent, the fault is not to be attributed to the Profeſſor.

If the principles advanced and illuſtrated in the following pages ſhould appear to Engliſh Artiſts and Connoiſſeurs as important as they did to their Author, and to his Admirers, in the Dutch Netherlands, the Tranſlation cannot be unacceptable in a country ſo renowned for its Painters as Great Britain. They apparently open new ſources of improvement, and point out to younger Artiſts a new path for generous emulation. It has been acknowledged by thoſe who frequent the many exhibitions of Paintings in the Metropolis, that ſomething of a languor is taking place, from a kind of uniformity that threatens to be prevalent. The eye of the viſitor is fatigued with viewing a repetition of the beauties of the preceding year; and the moſt benevolent critic is wearied of repeating the ſame accents of praiſe, in their approbation of excellencies, which, being no longer novel, have loſt much of their power to charm. Will it be too ſanguine an expectation, if the hope be indulged, that the following Publication will inſpire Artiſts with freſh vigour, by pointing out to them unbeaten tracts, enabling them to

infuſe unuſual ſpirit, dignity, and character into ſome of their performances; and by teaching them to avoid in others thoſe inaccuracies which have been perpetuated by an implicit confidence in the rules and examples of the moſt celebrated Maſters? May we not preſume alſo, that ſome congenial mind, who unites deep ſkill in Anatomy with the love of Painting, will be animated to purſue the ſubject to a greater extent, and complete a ſtudy which profeſſor Camper has ſo happily begun; and thus procure honour and emolument to himſelf, by multiplying the ſources of delight to every man of taſte?

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BOOK II.

Corrections to be made in the Plates.

Dotted lines are wanting from G to S, or from the Fore Teeth to the Chin, in Plate I. Fig. 3. Cranium of the Negro, and alſo from a to b, over the vertex, in the lower Figure. The Ear of the Negro is too erect; and the Line from r to s, ſhould fall before the Lobe.

Plate V. Fig. 2. Dotted Lines are wanting from M to M, in the Cranium of the Child's Head in Front.

BOOK SECOND.

Let A F be engraved on Plate IV. Fig. 4. in place of A T. See p. 152, bottom line, Camel.

Let ϒ be engraved on Plate V. Fig. 5. inſtead of γ, *i.e.* the Greek g. See p. 153. l. 10.

Let b, inſtead of B, be engraved on Plate VI. Fig. VI. See p. 161. l. 13.

Let o, in the Hoof of the Horſe, Plate V. Fig. 8. be a Capital Letter.

ERRATA.

Page 35, line 8, *for* of, *read* or
36, l. 4 from bottom, *for* from the bottom of the lower jaw, *read* from the occiput
41, l. 7, *for* again, *read* gain
63, l. 2 from bottom, *for* particulars, *read* particularities
84, l. at bottom, *for* conſonant, *read* inconſonant
105, l. 4, *for* ſunt, *read* ſunto
107, l. *for* Socicles, *read* Sofocles
166, l. in the note, *for* 12, *read* 1, 2, &c.

Errors in the References.

39, l. 14, *read* C D was as 11, : 7 $\frac{1}{4}$.
46, l. 6, *for* T T. *read* T F.
49, l. 9, *for* from N. to C. *read* from N. to G.
82, l. 7 from bottom, *for* E G. or D. *read* E. G. or D.
98, l. 15, *for* ſee Pl. IV. *read* ſee Pl. II. Fig. 4.
102, l. 2, *read* ſee D B, and X E B, in the lower ſketch of Fig. 4.
109, l. 8, *for* E F, *read* F B.
116, l. 9 from bottom, *for* N Q, *read* L Q.
117, l. 3 from bottom, *for* K. *read* H.
136, l. 9 from bottom, *for* Fig. 2. *read* Fig. 11.
150, l. 14, *for* E to S, *read* F to S.

INTRODUCTION.

PAINTING, and whatever is relative to the Art, have been my favourite amuſements from my earlieſt years: and as the characteriſtic differences in men and animals appeared to me the moſt intereſting objects in nature, I was diſpoſed to pay more than ordinary attention to theſe. — To draw, and to model in clay, were the recreations of my childiſh hours. As I grew older, I was particularly ſtruck with the figure and colour of the Moors; and with the difference in features and complexion between the Eaſt Indian-blacks and the natives of Africa.

Whenever I copied after the beſt models of the ancient Greeks, — drew the head of a Pythian Apollo, a Venus de Medicis, a Hercules of Farneſe; or placed before me the beautiful figures of Michael Angelo, Queſnoi, and other celebrated maſters of later date, I obſerved a very great difference between the faces of theſe and our own. I perceived alſo

that they were much more pleaſing than any of the figures of the Flemiſh ſchools, without being able to aſcertain in what this preference might conſiſt.

I had learned to make uſe of ovals and triangles, according to the principles laid down in every treatiſe on the art of Drawing; and yet when I copied from models in plaſter, from paintings, or from life, I always experienced not only a difficulty, but an abſolute impoſſibility of ſketching heads to advantage; nor was I ſatisfied with the proportions recommended.

At ſixteen years of age I began to paint in oil-colours, chiefly after the Flemiſh maſters: but as I was already captivated with the ſuperior dignity obſervable in the antique models, the ſtyle of theſe maſters was not agreeable to me. At the age of eighteen, my inſtructor, Charles Moor the Younger, to whoſe attention and care I am indebted for any ſubſequent progreſs I may have made in this art, ſet me to paint one of the beautiful pieces of Van Tempel; in which there was the figure of a Moor, that by no means pleaſed me. In his colour he was a Black; but his features were European. As I could neither pleaſe myſelf nor gain any proper directions, I deſiſted from the undertaking. By critically examining the prints taken from Guido Reni, C. Marat, Seb. Ricci, and P. P. Rubens, I obſerved that they, in painting the countenances of the Eaſtern Magi, had, like Van Tempel, painted black men; but they were not Moors. The celebrated Engraver, Cornelius Viſſcher, was the only

one who appeared to me to have followed nature, and to have properly characterized Moors.

As I advanced in years, my attention and penetration increaſed; and I imagined that, by a ſingle glance of the eye, I was able to diſtinguiſh antiques, and to mark, from the ſtyle, the very period in which they were executed. The majority of prints taken from the moſt beautiful engravings on precious ſtones, of antiquity, were diſſatisfactory: ſomething of a Gothic taſte was intermixed. This is the caſe with the repreſentations of the Roman Emperors, by Hub. Goltz, publiſhed in the year 1645, which is otherwiſe a fine piece; and in his *Græciæ ejuſque Inſularum* and *Aſiæ Min. Numiſmata*; although in ſome few of them the Greek ſtyle is more or leſs preſerved. In the work of *J. Triſtan, Comment. Hiſt. contenant en abrege les vies, eloges*, &c. *des Empereurs*, &c. *juſques a Pertinax*, the antique is entirely loſt, through the unſkilfulneſs of deſigners and engravers. This obſervation is applicable to L. Beger, Bonannus, &c. But the *Numiſmata* in the *Theſaurus Græc. Antiq.* of Gronovius, and thoſe of Sicily, Naples, &c. of Grævius and Burmann, are the moſt intolerable of all.

In the works of Mountfaucon, J. Spon, &c. the deſigns were made by artiſts of very moderate talents; and are accordingly very imperfect. This could not offend the editors, as their attention was totally confined to the hiſtorical branch, and they could neither perceive nor reliſh tranſcendent beauty; which, however, did not eſcape the notice of Baron

Stoſch, notwithſtanding that Picart has generally ſpoiled it by his vicious taſte. Count Caylus, though a good deſigner, has failed in this reſpect. Barbault has, in a few inſtances, ſucceeded incomparably well.

It was not before I had formed the plan of this Treatiſe, in the year 1768, that I enjoyed the opportunity of conſulting the excellent obſervations of Winkelman on the * Imitation of the Greeks in Painting and Sculpture; his ‡ Preliminary Diſcourſe concerning the Art of Deſigning among the Antients, and his § Monuments of Antiquity. I have ſince ſtudied his works with the utmoſt advantage, although his notions of ideal beauty have miſled numbers. What this penetrating obſerver terms *ideal*, is in fact founded upon the rules of optics, as I ſhall fully ſhow when I treat of the beauty of the human countenance. The diſſertation of Tenkate upon Ideal Beauty, has great merit; but it does not inſtruct us in its true nature or principles. Following Lomazzo, he has been miſled by him. They are both embarraſſed by adopting the rules which conſtitute the harmony of muſic, and which are not applicable to painting; as the beauty of the latter does not depend upon certain immutable proportions, but on other circumſtances.

The excellent letter of my eſteemed friend, the profound Hemſterhuys, teaches us the influence of the Beautiful upon

* Gedänken uber die Nachahmung der Griekiſchen werke in der Mahlereij und Bildhauerkunſt.

‡ Trattato preliminare dell arte dell diſegno degli antichi popoli.

§ Monumenti antichi inediti.

the mind; but it does not indicate in what beauty conſiſts; or propoſe rules by which we may trace or produce it in the figure of objects.

I have examined the works of Natter, Mariette, and the cabinet of the Duke of Orleans; and in all of theſe I have remarked Manner, and alſo a deficiency of that *tact* which it is the object of theſe works to inſpire. Even Winkelman is deſtitute of it in execution. So difficult is it to catch the ſpirit of the antients, as long as the cauſes of their excellencies are not inveſtigated, and reduced to principles.

Although Albert Durer was in reality a great maſter (and when we advert to the age in which he flouriſhed, we muſt allow him to have poſſeſſed extraordinary merit) yet he has laid the foundation of a bad taſte, which has diffuſed itſelf all over Europe, not excepting Italy; and which continues to exert its pernicious influence; as is manifeſt from Lomazzo, who follows him implicitly, excepting in the doctrine of muſical harmony being applicable to painting. It is alſo obvious that Lomazzo has conſulted *Pomponius Gauricus de Sculptura*, and Dolce, as well as A. Durer. Blind at thirty years of age, this man was obliged to ſeek a ſubſiſtence by his writings. Hence his numerous publications; moſt of which treat upon the ſame ſubjects. With what perſpicuity he defines the beautiful! *Il bello per coſi dire, non e bello, che par la ſola ſua bellezza* *. "The beautiful, ſo to expreſs myſelf,

* Trattato della Pittura. 1584. pag. 196.

" is merely beautiful by its own beauty." — How extravagant!

To return. I muſt further remark, that the excellent prints from the works of Rafael, Pouſſin, Titian, and Pietra Teſta, pleaſed me much better than the fineſt pieces of Rubens or Van Dyck; in both of which, the diviſions of Albert Durer, and the imperfections of his oval were very conſpicuous. This is particularly the caſe in the painting of the Holy Virgin and Child, in the celebrated gallery at Duſſeldorp; which is in every other reſpect an excellent performance.

By frequently modelling in clay, after the fineſt heads of antiquity, I learnt that Albert Durer, by looking at the object with both his eyes, had made them too broad; and I alſo learnt that a painter, to excel, muſt be a proficient in modelling as well as in drawing. This will beſt enable him to form a genuine idea of the real form of all objects. A knowledge of optics is alſo requiſite; as has been fully proved in my Inaugural Diſſertation *.

In a ſeparate chapter, on the conſtituent beauty of forms, I ſhall hereafter ſhow how much depends upon avoiding a defective manner of viewing the object which is occaſioned by the refraction of the rays of light. In order to ſucceed, it is alſo neceſſary to attend to the excellent rule of Lyſip-

* Publiſhed in the year 1746. It treats of the conſtruction of the eye, and the nature of viſion.

pus *; *i. e.* To make the head ſomewhat leſs, the body more ſlender and delicate, than they really are, and they will be repreſented to greater advantage than by the moſt ſcrupulous exactitude.

When I gave lectures in the public college at Amſterdam, as Profeſſor of Anatomy, I found, by comparing bodies of various ages that were brought to me for diſſection, that the oval was not calculated for the delineation of the features with any degree of accuracy or expedition. With this idea I ſawed ſeveral heads, both of men and of animals, perpendicularly through the middle; and I was fully convinced that the ball of the head forming the cavity deſtined to contain the brains, was in general very uniform; but that the poſition of the upper and lower jaws was the manifeſt cauſe of the moſt ſtriking differences. The ſame obſervation may be extended from quadrupeds down to the finny race: and it has ſuggeſted hints ſufficiently numerous to form a ſeparate Treatiſe.

The above examination has alſo enabled me to diſcover whence thoſe changes ariſe which progreſſively take place in our features, from infancy to the moſt advanced age. But I ſtill was unable to explain in what manner it was that the Greeks ſhould have acquired, at a very remote period, that

* Capita minora faciendo, quam antiqui: corpora graciliora, ſiccioraque, per quæ proceritas ſignorum major videretur: — ab illis factos quales eſſent homines, a ſe quales viderentur eſſe. PLIN. Lib. xxxiv. Cap. viii. Sect. 19. Pag. 652. § 6. & 653.

ſingular and dignified expreſſion which they gave to their figures; and which I have never ſeen perfectly equalled. I perceived, moreover, that in the copies taken from theſe, the facial line did not differ from our own. This will appear by comparing the 5th figure of Plate X. (which is the head of Auguſtus Cæſar, engraved by Dioſcorides) with the firſt figure of the ſecond Plate.

Having contemplated the inhabitants of various nations with greater attention, I conceived that a ſtriking difference was occaſioned, not merely by the position of the inferior maxilla, but by the breadth of the face, and the quadrangular form of this maxilla. This idea was confirmed by contemplating a conſiderable collection which I afterwards made of heads, that acknowledged various countries for their parents; or of exact copies from them. Excluſive of ſeveral ſkulls of my countrymen, and of the adjacent nations, I poſſeſs two of Engliſh negroes (the one was a young perſon, the other advanced in years) — the head of a female Hottentot, — of an inhabitant of Mogul, — a Chineſe, — a youth of Madagaſcar, — a Celebean, — and finally, the cranium of a Calmuck; that is, of eight different nations.

When I was at Oxford, in the year 1786, I alſo took a ſketch of the lower jaw of a native of Otaheite, that had been brought over by Captain King. I have never been able to obtain poſſeſſion of the cranium of a native American, nor even of an Anglo-American, which has, however, ſome peculiarities that were pointed out to me by that celebrated artiſt

Mr. Weſt; of which, as he was born in Pennſylvania, he was the beſt qualified to judge. Their face is long and narrow; and the ſocket of the eye ſurrounds the ball in ſo cloſe a manner, that no ſpace is allowed for a large upper eye-lid; which is ſo graceful to the countenance of moſt Europeans.

When in addition to the ſkull of a negro, I had procured one of a Calmuck, and had placed that of an ape contiguous to them both, I obſerved that a line, drawn along the fore-head and the upper lip, indicated this difference in national phyſiognomy; and alſo pointed out the degree of ſimilarity between a negroe and the ape. By ſketching ſome of theſe features upon a horizontal plane, I obtained the lines which mark the countenance, with their different angles. When I made theſe lines to incline forwards, I obtained the face of an antique; backwards, of a negroe; ſtill more backwards, the lines which mark an ape, a dog, a ſnipe, &c. — This diſcovery formed the baſis of my edifice.

The large and populous city of Amſterdam, moreover, afforded me various opportunities of collecting the ſkulls and other bones of the deceaſed, in a regular progreſſion, from earlieſt infancy up to decrepit age. By comparing theſe with each other, my thoughts were directed to the natural difference occaſioned by the gradual growth of the parts in youth, and their decay in advanced age; and alſo to the manner by which this diſcrepancy of years might be moſt accurately delineated. Hence aroſe the firſt ſtage of my edifice: the ſecond was formed by a critical inveſtigation of the line which

ancient maſters preferred, in their beſt productions. Finally: While I was ſcrutinizing the utility of the oval and triangle, which are propoſed as the ſureſt direction for deſigning a human head, the examination and compariſon of the ſkulls and maxillæ which had been ſawn through, diſcovered to me a new and more ſimple manner of portraying any form of head I pleaſed, either of men or of animals, with a much greater degree of preciſion.

As I met with few connoiſſeurs in painting, and ſtill fewer who enjoyed ſpeculations of this kind, my purſuits were totally neglected until the year 1767; when, being in company with my much eſteemed friend Mr. F. Van Hemſterhuys, at the houſe of his Excellency the Count of Bentinck, Lord of Rhoon, &c. we examined together a number of beautiful Intaglios and Cameos; and I was able to diſtinguiſh immediately the originals from the counterfeits, the Grecian from the Roman artiſts. This induced them to enquire into the principles of my knowledge; which I explained, with the addition of the leading obſervations I had formerly made. The Count, who was a diſtinguiſhed judge and ſound critic in every branch of the polite arts, was ſtruck with the ſimplicity of my diſcoveries, and urged me, with his uſual politeneſs, to arrange and more fully explain my ideas, as they appeared of utility.

Upon retiring to my country reſidence, in order to enjoy a relaxation from my academical labours, I undertook this arduous taſk. But numberleſs difficulties preſented themſelves.

It was not only neceſſary to make drawings of the different bones of the face, but to do this with accuracy. This was finally ſurmounted. The drawings were to be reduced to the ſame ſcale, and properly arranged. The beſt antiques, and alſo the prints taken from them, were to be examined and ſtudied. Ancient and modern writers on the Natural Hiſtory of Man, and on the Principles of Drawing, were to be peruſed with attention, digeſted, &c. &c.

The Work ſwelling under my hands, not only became more extenſive, but promiſed to be more extenſively uſeful. I flattered myſelf that it would prove acceptable, not only to thoſe who admire the maſterly performances of ancient artiſts, but alſo to thoſe who are engaged in the ſtudy of natural hiſtory, and to all young pupils in the arts of drawing and of ſculpture. Employing every hour of leiſure from other occupations, I finiſhed the ſketch of the preſent Treatiſe, towards the end of Auguſt in the year 1768.

Delighted with my diſcoveries, as is generally the caſe, I communicated them to ſeveral admirers of the fine arts. They imagined that conſiderable ſervice might be rendered to the ſcience of Painting, and particularly to the Academy of Drawing, eſtabliſhed at Amſterdam, were I to deliver ſome public lectures upon the ſubject, before the members of that ſociety. Theſe I delivered on the firſt and ſecond days of Auguſt, in the year 1770, before a numerous and reſpectable audience. The preſident and chief patron of the inſtitution,

Burgo-maſter Huygens, and the other directors, were pleaſed to expreſs their approbation of my endeavours, by preſenting me with a golden medal *.

Not leſs than ſixteen years elapſed before a convenient opportunity of publiſhing this Treatiſe preſented itſelf. Various engagements prevented me from reviſing it with attention, in order to enlarge or abridge, as might be judged neceſſary. The difficulty I had to find out an intelligent and ſkilful engraver, was another obſtacle. At length, the celebrated Mr. Vinkeles was prevailed upon to engrave the ſketches: but the various occupations of this diſtinguiſhed artiſt were the cauſes of further procraſtination. At length it appears, accompanied with the wiſhes of its Author, that it may meet with indulgence, and give ſatisfaction.

* The Medal was preſented after the Author had delivered ſome other lectures which completed his plan. They treated of the ſubjects contained in the Second Book of this Work. It was the uſual medal of the academy; on the reverſe of which was the following inſcription, in the Dutch language: — "Preſented to the learned "PETER CAMPER by the Directors of this Academy, as a grateful Acknowledg- "ment for the uſeful Lectures delivered before the General Aſſembly in the years "1770 and 1774."

BOOK I.

PART THE FIRST.

CHAPTER I.

CONCERNING THE CHARACTERISTIC DIFFERENCE OF FEATURES IN THE MOST DISTINGUISHED PEOPLE ON THE GLOBE.

WHEN we obſerve a concourſe of people aſſembled together in a large commercial city, from the different quarters of the globe, we are able to diſtinguiſh, by a ſingle glance of the eye, not merely negroes from white men,—but among the latter we diſcriminate Jews from Chriſtians, Spaniards from Frenchmen or Germans, and theſe from the Engliſh. It is alſo poſſible to diſtinguiſh natives of the ſouthern parts of France from thoſe of the more northern, unleſs they have been blended by intermarriages. The Scots are alſo known from the Engliſh; and both from the Iriſh. In the cities of Holland national phyſiognomy is loſt; but iſlanders retain the original features. The inhabitants of

Hindelopen, Molkwerum, and Koudum *, have ſtill the ſmall face and long chin of their anceſtors. Thoſe alſo of the Bildt * are eaſily diſtinguiſhable from their neareſt continental neighbours, by their ſhort and compreſſed features.

Each country, therefore, has ſome peculiarity which is perpetuated, until the accidental blending of different people renders their diſtinguiſhing marks dubious, or entirely obliterates them. Wars, colonizations, commerce, navigation, and ſhipwrecks, have ſo completely intermixed the inhabitants of the moſt diſtant countries, that characteriſtic diſtinctions are only to be found among thoſe of central provinces, that are remote from the acceſs of ſtrangers. In countries that lie contiguous to each other, and in iſlands adjacent to continents, the change is gradual, and ſcarcely to be perceived but by comparing the different extremes.

People are diſtinguiſhed according to the grand diviſion of continents, into Europeans, Africans, Aſiatics, and Americans. The inhabitants of theſe principal parts of the earth, including the iſlanders of the South Seas, inhabitants of New Holland and New Zealand, have never been diſcriminated from each other by permanent characteriſtics, or perſonal indications alone. Some attribute peculiar to the quarter of the world; or the ſpecification of ſome ſingular ornament, pecu-

* Theſe are inhabitants of different diſtricts in Friezland, on the borders of the Zuyder Sea. They are remarkable for retaining the original ſimplicity of manners, ſingularity of dreſs, and rejecting matrimonial connections with any of their neighbours.

liarity of dreſs or cuſtom, have always been added. Thus, an Aſiatic is diſtinguiſhed from an European by colour and dreſs: the African and American, being ſomewhat ſimilar in colour and dreſs, are known by the addition of a crocodile, an elephant, a cargo of tobacco, inciſion of the ſkin, tatowing, plumes of feathers, &c.

It is, however, a fact, that the inhabitants of Northern Europe (the Laplanders for example) are of a more tawny complexion than thoſe of Java; nor are many of the Perſians, or the ſubjects of the Mogul empire, of a darker complexion than the Spaniſh. Even the Caffres, although they are inhabitants of Africa, are remarkably different from the Angoleſe and the Nubians.

Some of the American tribes ſeem to derive their origin from the northern countries of Aſia. The ſimilarity of their make, mode of living, manners, religion, &c. render this conjecture extremely probable. The many journies alſo taken from Ruſſia, through Siberia, Kamtſchatka, St. Andries, &c. to America; and more particularly the celebrated voyage of the late Capt. Cook, afford additional proofs of the fact.

The poſſibility of making the paſſage, will be obvious to every one who conſults the excellent chart publiſhed by that unfortunate circumnavigator, in his laſt Works; and he will be convinced that it was not difficult for the Laplanders, Samoiedes, Siberians, Kamtſchatkans, and the ſavage nations

of Aſia, to find their way to America through the ſame paſſage.

No man who contemplates the whole human race as it is now ſpread over the face of the earth, without a predilection for hypotheſis, can doubt of its having deſcended from a ſingle pair, that were formed by the immediate hand of God, long after the world itſelf had been created and had paſſed through numberleſs changes. From this pair all the habitable parts of the earth were gradually propagated. The difference of colour is not an objection of moment. This frequently varies, while the contexture of the ſkin is uniformly ſimilar in all men. I have demonſtrated, upon a former occaſion*, that it is immaterial whether the colour of our firſt parents was black or fair, ſince a change from white to black is equally great as the reverſe.

I have in my collection of natural curioſities, ſeveral ſpecimens of the ſkins of Moors, Italians, and of the faireſt Dutch women, in which the *membrana reticularis* is to a greater or leſs degree of a duſky hue; ſo that no eſſential difference exiſts, whichever of the propoſitions be advanced. It ſometimes happens that this reticular membrane becomes as black in our faireſt women, during their pregnancy, as that of the blackeſt negro or Angoleſe. Of this a curious inſtance preſented itſelf in the year 1768. The abdomen and breaſts of a woman naturally of a fair complexion, had totally changed

* In a treatiſe on the colour of negroes.

their colour. The celebrated *Le Cat* † has alſo mentioned ſeveral inſtances of a ſimilar kind. Darkneſs of complexion begins alſo to diminiſh in proceſs of time: of which I have preſerved various ſpecimens in the ſkins of Moors.

Thus it is evident that the faireſt ſkin may become black, and the darkeſt become fair, without our being able to aſcertain the immediate cauſe. The influence of the ſun is univerſally acknowledged; but the above-mentioned changes in pregnant women, to which might be added inſtances of white negroes, and of thoſe who are rendered pale through various indiſpoſitions, manifeſt that other cauſes operate upon this membrane, as well as the ſun's rays. And why not? Does not the blood throw off dark coloured particles to the inward ſurface, and to the iris, of the eye, while the *tunica albuginea* remains perfectly white? Many other inſtances might be given, where different parts of the body acquire ſuch a ſurface that they do not reflect the rays of light: that is, they appear dark. Every Tyro in philoſophy knows, that objects have no colour in themſelves; and that the idea of colour is excited in us according to the manner in which the rays of light are refracted.

Since we are totally ignorant at what period after the formation of the globe man was created, and the human race began to ſpread over the earth, we ſhall confine ourſelves to the differences in the human ſpecies that now exiſt. The

* Traité de la couleur de la peáu humaine. *Edit. Amſterd.* Art. IV. p. 130.

great Buffon has anticipated and exhauſted this ſubject, in his excellent diſſertation "On Man, and the Varieties in the "Human Species *." I ſhall merely ſelect the peculiarities that refer more immediately to our purpoſe, and take the Calmucks as a ſpecimen.

The Calmucks, compared with ourſelves, and more particularly with the moſt celebrated figures of antiquity, are deemed the ugliеſt of all the inhabitants of the earth. Their faces are flat, and very broad from one cheek-bone to the other; the noſe is ſo flat, that the ſight penetrates into the noſtrils; the eyes are near to each other; the lips are thick, and the uppermoſt lip is long. They reſemble the inhabitants of Siam, as deſcribed by Loubiere, whoſe faces are broad acroſs the cheeks, while their foreheads and chins terminate in a point; ſo that their form is more rhomboidal than oval. Compare Plate I. Fig. 4. with Plate III. Fig. 3. which repreſent the profile and front face of a Calmuck.

According to Buffon, the face of the Chineſe is broad and round. They have ſmall eyes and large eye-brows. The only Chineſe I have ever ſeen was at London, in the year 1785. The ſmallneſs of the noſe did not ſtrike me. Upon examining the cranium of a Chineſe, in my poſſeſſion, I obſerve that the cavities or ſockets of the eyes, are ſituated near together, but that they are placed obliquely; nor are they high in the forehead. The *os jugale*, or cheek-bone, is not

* See Nat. Hiſt. Part III. pag. 371.

broad, but prominent. The ſuperior maxilla, from the bottom of the noſe to the teeth, is narrow; as in the Otaheites, and contrary to that of the Calmuck. Conſequently they cannot have a broad upper lip.

The greateſt ſingularity that ſtrikes me equally in a Celebeſe, a Chineſe, and an Otaheite, conſiſts in the rectangular form of the inferior maxilla. See Plate I. Fig. 4. * V. S. I have alſo remarked the ſame in all the women born in Aſia of Dutch or Engliſh parents. This renders the lower part of the face much broader than it is in other nations.

The whole form of the cranium of an Otaheite and a Chineſe is ſo very ſimilar, that I might venture to conclude that the inhabitants of Otaheite and the Friendly Iſles were a colony from China, notwithſtanding the greatneſs of the diſtance. On examining the cranium of a Moluccan that is in my poſſeſſion, I obſerve that the angle of the lower jaw is not ſo large, but that the upper jaw projects more; as in the negro and the Calmuck.

I readily agree with Buffon, that the inhabitants of the northern parts of the Mogul empire and of Perſia, the Armenians, the Turks, Georgians, Mingrelians, Circaſſians, and the inhabitants of Europe in general, are not only the faireſt, but poſſeſs greater elegance of form than any other people. I have, however, ſeen many Armenians whoſe countenances were not pleaſing. The natives of the more ſouthern parts of France, particularly the females, ſtill retain the ſemicircular

form of the upper maxilla, and that ſmoothneſs of countenance which is ſo ſtriking in the Pythian Apollo and the Grecian Venus. Moſt of the northern French have very ſmall heads and ſharp faces, like the Scots and many among us: that is, the *os jugale* recedes, and does not ſpread as in the Calmuck. Compare Plate II. Fig 1. Q. with Plate I. Fig. 4. Q. This difference is not eaſily diſcerned by one that is not accuſtomed to modelling.

But there is no nation ſo diſtinguiſhable as the Jews. Men, women, and children, from their births, bear the characteriſtic marks of their race. Mr. Weſt, the diſtinguiſhed painter, with whom I have frequently converſed upon the ſubject, confeſſing my inability to diſcover in what this national mark conſiſts, places it chiefly in the crooked form of the noſe. I acknowledge that this contributes much, and that it gives them a reſemblance to the Laſcars, of whom I have ſeen numbers in London; and have even taken the model of a face in Paris-plaſter. But there is ſtill a ſomewhat unexplained. It is upon this account that the famous De Wit has ſo ill ſucceeded in the council-chamber at the Stadt-houſe of Amſterdam. He has exhibited in his paintings ſeveral men with beards, but they are not Iſraelites.

It would be impracticable to delineate all the characteriſtic varieties that exiſt in nature. To avoid an expenſive multitude of plates, I ſhall conſider the Calmuck as the repreſentative of all Aſia (from Siberia to New Zealand) and alſo of North America; as it is more than probable that this

people are deſcended from the Northern Aſiatics. We can determine nothing concerning the Mexicans or Patagonians, as they are not aborigines; and are moſt probably deſcended from Europeans.

2. The head of an European ſhall be conſidered as a ſpecimen of all Europe, Turkey, Perſia, and the largeſt part of Arabia, as far as Indoſtan.

3. The head of an Angoleſe negro ſhall be ſubſtituted for all Africa; alſo for the Hottentots (who do not materially differ from the negroes); for the Caffres, and for the natives of Madagaſcar. The Moluccans ſeem to have blended together the characteriſtics of the Aſiatic and the African.

4. I have prefixed the cranium of the *ſimia caudata*, or tailed ape, and of a ſmall orang-outang, in order to demonſtrate the importance of the facial line, which is applicable to all animals.

CHAPTER II.

THE OPINIONS OF ANCIENT AND MODERN WRITERS CONCERNING THE DIFFERENT SHAPES OF THE HUMAN HEAD, STATED AND REFUTED.

HERODOTUS, Hippocrates, Suidas, Ariſtotle, Pliny, P. Mela, and many other writers of antiquity, have uniformly maintained that the variety of forms obſervable in different nations, do not altogether ariſe from the climate and other natural cauſes, but alſo from ſome original artifice, which finally gives birth to a determined form. This opinion has been adopted by ſome of the moſt eminent writers among the moderns; as Cardan, Veſalius, Schenck, and more recently Haller and the Count de Buffon; and it ſeems to be confirmed by the remarks of numberleſs travellers. I have controverted the ſentiment upon a former occaſion*. The whole of the preſent Treatiſe will manifeſt its abſurdity.

I did not venture to oppoſe an opinion uniformly ſupported by ſuch reſpectable authorities, until, about thirty years ago, the fœtus of a female negro came into my poſſeſſion. In this fœtus, which was of about ſix months, all the features were ſo ſtrongly marked, that every perſon could immediately diſtinguiſh the negro child, although the colour of the ſkin was not changed into black.

* See Prijſverhandeling over de natuurlijke opvoeding des Kinderen. *Haarl. Verhand.* tom. VII. Deel I. p. 3-4.

In the year 1758, I diſſected publicly at the anatomical theatre at Amſterdam, the body of a negro lad, about eleven years of age. This afforded me an opportunity of demonſtrating all thoſe diverſities in the cranium, which nature had effectuated. By nature, I mean the influence of country, nutrition, air, &c.

I do not affirm that artifice has never been productive of changes. When I was at London, in the year 1785, Mr. Cline, Surgeon of St. Thomas's Hoſpital, allowed me to take a draught of the cranium of an aged man from St. Vincent (one of the Carribean Iſlands) of which the whole forehead was flattened, the crown peaked, while the parietal bones remained convex; which gave a very oblong form to the head. Hunauld has deſcribed and delineated one of the ſame kind: and Winſlow mentions another inſtance of a ſimilar nature. On my viſit to Oxford in the ſame year, I made a drawing of the cranium of a young man that was brought from Nootka Sound, by Captain King, which was alſo compreſſed into nearly the ſame form. This is depoſited in the collection belonging to the anatomical theatre of Chriſt's College.*

If this be a national cuſtom, it is a ſubject of wonder how ſo ſtrange a practice could have been introduced into three countries, ſo very remote from each other; and it is a ſtill

* Mr. Forſter has obſerved, that the inhabitants of Malicolo have the forehead very much flattened, without deciding whether this proceeded from art, or was natural. — See *Obſerv. faites pendant le 2d Voyage de Monſ. Cook, Paris, Tom. VIII.*

greater wonder that it does not prove injurious to their mental faculties. It is moſt probable that theſe were ſingular inſtances; for Captain Cook, ſpeaking of the inhabitants of Nootka Sound, in his laſt voyage*, ſimply obſerves, that they have the forehead rather low; without making any other remarks. Mr. Hughes alſo, who deſcribes the inhabitants of Barbadoes, which is contiguous to St. Vincent, makes no mention of ſuch a cuſtom; and extols the vivacity of the Carribees. But to return to the antients.

Hippocrates † ſeems diſpoſed to attribute the particular form of the head to the conduct of midwives and nurſes. He obſerves that many perſons, considering the oblong form of the head as the moſt graceful, preſs them flat during infancy, and that they thus acquired naturally the particular ſhape which nations conſidered as the moſt pleaſing.

Veſalius ſupports this idea, and alſo aſſerts that ſome midwives have been bribed by mothers, to ſhape the heads of their children into the form of a ball. He conjectures that the flatneſs and breadth of the occiput in the Germans, proceeds from the manner in which infants are bound in a portable cradle, which the mothers carry on their backs when they travel; and that the more oblong form obſervable in the heads of Dutch children, ariſes from their being perpetually placed on the ſide in the cradle. Neither of theſe eminent men has

* Vol. II. Chap. 2. pages 288 and 301.

† De Aere & Locis, p. 289

taken into consideration the natural form of the pelvis; which in this country particularly, is frequently ſo narrow, that the head of the infant cannot paſs, until the throes of the mother have moulded it into an oblong form, by which the diameter is leſſened.

It is therefore not ſurprizing that the learned ſhould have acknowledged the influence of art, or that Scaliger* ſhould have confidently aſſerted that the Genoeſe, having derived the cuſtom from their anceſtors the Moors, ſhould preſs the heads of their ſleeping children until art became nature, and the whole race was born with heads and minds of a Thersites. Cardanus † expreſsly ſays, that among the provincials of Portus Vetus, in the Weſt Indies, the people have no necks, but heads of a quadrangular ſhape; that this originated from art, it having been cuſtomary to compreſs the head between planks; but that nature finally ſucceeded to art.

Count de Buffon ‡ relates from Raleigh, that there are nations in Guiana whoſe necks are ſo extremely ſhort, and ſhoulders ſo elevated, that their eyes ſeem to be placed upon their ſhoulders, and their mouths upon their breaſts. The Count properly compares theſe to the Scythians, and to the Acephali of the antients. It is very probable that the antients conſidered apes and the orang-outang as belonging to the

* Comm. in Theophraſt. Lib. V. p. 287.
† De Varietate, Lib. V. Cap. 43.
‡ Nat. Hiſt. page 505.

human race; and alſo the modern travellers, ſeeing them at a diſtance, have miſtaken them for men.

Pliny, when he treats of Æthiopia*, obſerves that the Blemmyi have no heads,—that their eyes, and mouths are placed upon their breaſts; and that ſome who are deſtitute of heads, have their eyes placed upon their ſhoulders. He alſo advances †, upon the authority of Eudoxus, that in ſome parts of India the men have feet an ell long, while thoſe of the women are ſo ſmall that they have the name of Struthopodes, ſparrow-feet; and alſo, that the ears of ſome are ſo long and broad, that they can hide themſelves behind them.

Strabo ‡ relates, upon the teſtimony of Oneſicritus, that the ears of ſome men in India hung down to their heels, ſo that they could ſnugly ſleep upon them. However, he allows the accouut to be fabulous. Pomp. Mela § aſſerts with confidence, that the Otomegalos had ſuch large ears that they could entirely envelop themſelves in them.

C. J. Solinus ſays ¶ that there are men in India, meaning the Panotes, who cover themſelves with their own ears.

In the voyages of Captain Cook ** mention is made of the inhabitants of Eaſter Iſlands, whoſe ears are ſlit through the middle, and hang down almoſt to their ſhoulders.

* Lib. V. Chap. viii. page 252. † Lib. VII. chap. ii. page 373. ‡ Lib. V. page 1038. § Lib. III. chap. vi. page 270. ¶ Chap. xix. page 28.
** See Paris edition, 1778, Tom. ii. Pl. 26 and 27.

Count de Buffon enlarges very judiciouſly upon the cauſes of the national differences that take place in different people. He reduces theſe to three: — 1ſt, The influence of climate; 2d, Of food; 3d, Of manners and cuſtoms.

Reſpecting the firſt cauſe, that the colour depends upon it, does not admit of a doubt; and yet it is a fact, that, in the coldeſt climates, ſuch as Greenland and Kamtſchatka, the natives are nearly as black as in Madagaſcar. However, the hotteſt climates yield men of the deepeſt jet, unleſs they intermix with the inhabitants of other nations.

The peculiar forms of the eyes, cheeks, maxillary bones, and particularly of the noſe, may ſafely be attributed to the influence of climate.

As we are upon the ſubject, it will not be improper to obſerve, that no great dependence can be placed upon the portraits of different nations given in the voyages of Captain Cook. The painter, Mr Webber, has in moſt of them, indicated too much of the manneriſt: For example, In the women of Otaheite, repreſented in the 27th, 28th, and 29th plates. However, he appears to have been more exact in delineating the upper eye-lids in the women of New Holland and Diemen's Land, in plates the 6th and 7th. The women of Oonalaſka have the ſame phyſiognomy and the ſame ſmall eye-lids as thoſe of Kamtſchatka. Mr. Weſt informs me that this is a peculiarity obſervable alſo in the Engliſh that are born in North America.

The object of the painter ſeems to have been to repreſent the heads and countenances of well-proportioned men and pleaſing women. This is remarkably the caſe in the young females of Otaheite, particularly in the 28th and 29th plates; to whom he has given the features of Frenchwomen. On the other hand, thoſe animals which have nothing pleaſing in their figures, are always repreſented as monſters: as will appear from the 52d plate.

The influence of food may be learned from our own animals, the horſe, cow, and ſheep; although there is no great diverſity of climate in the different provinces of Holland. A rich or a meagre paſturage changes the form, the horns, and the wool of animals.

Under the article of Nutrition, I comprehend fluids and peculiarities of atmoſphere as well as food. But how theſe operate, and why the upper maxilla of a negro, and the cheek-bone of a Calmuck projects; and why the ſocket of the eye is lower and more oblique in a Chineſe and a Moluccan, cannot be fully explained. To obſerve and point out particularities is the principal buſineſs of the naturaliſt. Food and climate frequently co-operate; but we cannot ſuppoſe them productive of a different race. Black, tawny, and white men are ſimply varieties; they do not conſtitute eſſential differences. Our ſkin is preciſely of the ſame contexture with that of the negro; but it is not of ſo deep a dye.

It is probable that the hair becomes long and ſtraight, or curled or frizzled, according to the nature of the food,

chiefly. It is remarkable that the natives of Drent, and of the biſhopric of Munſter, have naturally ſleek hair; but after they have reſided ſome years in Amſterdam, it begins to curl. Of this we have many inſtances.

Manners and cuſtoms indubitably operate with great force upon the form and poſture of the body. A poliſhed education renders the whole figure elegant. Of this we have daily inſtances in poliſhed nations.

A particular manner of ſitting, of lying, of ſtanding, and walking; various corporeal defects, and other circumſtances of the like nature, give a particular caſt to the whole body. This is ſo obviouſly the caſe, that the countenance of a deformed perſon will become deformed; that is, it ſinks gradually by the preſſure of the brain, which has now loſt its equipoiſe. Thus the ſocket of the one eye ſinks lower than that of the other. Of this I have a very remarkable inſtance in my cabinet. In a perſon that is lame, the whole knee turns inwards by the twiſt given to the femoral bone. In thoſe who are formed awry, or are very round-ſhouldered, the clavicle is ſtraighter and longer. I ſhall not mention the pernicious effect of ſtays, with which ſo many of our females ſpoil the ſhapes of their children, without being admoniſhed by their own. We ridicule the Chineſe for maiming the feet of their females in ſo forcible a manner, and yet we are guilty of a ſimilar folly, as I have demonſtrated upon another occaſion*. Nay,

* In a treatiſe concerning the beſt form of a ſhoe.

we exceed them; for we not only incapacitate the female ſex from walking, but we diſable ourſelves. The fillets that bind up the hair of our ordinary women, leaves an impreſſion in their heads. Garters make a deep furrow under the knee, as effectually with us as with the inhabitants of Braſil, who conſider it as an ornament.

Education, employments, and a ſuitable mode of living, add a beauty both to the features and to the limbs. They render the whole body more elegant. Such is the difference between perſons genteelly educated and thoſe who have been totally neglected, that it is ſcarcely credible that manners and habits ſhould be able to effectuate ſuch changes in the ſame being.

Various endemic diſeaſes are not leſs influential. The rachites, or rickets, may occaſion numberleſs deformities of body. By the way, it appears from the writings of Hippocrates, that the inhabitants of the moſt ſalubrious climate in the univerſe were ſubject to this diſeaſe, as well as thoſe of the more northern or ſouthern regions, otherwiſe he would not have been able to deſcribe the diſeaſes which are derived from this ſource in ſo maſterly a manner.

In proportion as the indiſpoſitions ariſing from deformity are ſubjects for commiſeration, ought the cruel and inhuman taſte of the contemporaries of Longinus to be held in contempt. He tells us*, that they took pleaſure in keeping dwarfs locked

* Longinus de Sublimitate. § xiii. page 233.

up in confined cheſts, and in ſwathing them with bandages, on purpoſe to give them ſome ludicrous deformity. This conduct appeared to him ſo cruel, that he inclined to doubt the fact; but we learn from Suetonius, that ſuch deformed perſons were kept in all the houſes of the great. Tiberius prohibited theſe *ludibria naturæ*; but Alexander Severus, on the contrary, amuſed the populace with them. In Ruſſia they are ſtill exhibited in the palaces of the nobility.

CHAPTER III.

PHYSIOLOGICAL OBSERVATIONS CONCERNING THE DIFFERENCE OF FACES IN PROFILE; FROM APES, OURANGS, NEGROES, AND OTHER CLASSES OF PEOPLE, UP TO THE ANTIQUE.

THE aſſemblage of craniums, and profiles of two apes, a negro and a Calmuck, in the firſt plate, may perhaps excite ſurpriſe. The ſtriking reſemblance between the race of Monkies and of Blacks, particularly upon a ſuperficial view, has induced ſome philoſophers to conjecture that the race of blacks originated from the commerce of the whites with ourangs and pongos; or that theſe monſters, by gradual improvements, finally become men.

This is not the place to attempt a full confutation of ſo extravagant a notion. I muſt refer the reader to a phyſiological diſſertation concerning the ourang-outang, publiſhed in the year 1782. I ſhall ſimply obſerve at preſent, that the whole generation of apes, from the largeſt to the ſmalleſt, are quadrupeds, not formed to walk erect; and that from the very conſtruction of the larynx, they are incapable of ſpeech. Further: They have a great ſimilarity with the canine ſpecies, particularly reſpecting the organs of generation. The diverſities obſervable in theſe parts, ſeem to mark the boundaries which the Creator has placed between the various claſſes of animals.

The proximity of the eyes to each other, the ſmallneſs and apparent flatneſs of the noſe, and the projection of the upper lip, conſtitute the principal points of reſemblance; and theſe are much exaggerated by our modern naturaliſts, by their heightened deſcriptions, and embelliſhed plates; but they will immediately diminiſh in our eſtimation, if we give attention to the whole body, or minutely examine every part of the head. This will evidently appear by comparing together the different figures of the firſt plate.

All the figures in the firſt, ſecond, and fourth plates are ſketched in profile*. In this manner the differences may be more eaſily and accurately inveſtigated. The bones of the cranium may alſo be the better contemplated as the baſis of the features, which are immediately placed upon and under them.

In each of theſe figures the greateſt accuracy and preciſion have been diligently ſtudied. For example: An horizontal line has been drawn through the lower part of the noſe (ſee Plate 1. N.) and the orifice of the ear C.; and the four ſkulls were arranged with care on the line A. B.; attention being alſo paid to the direction of the *jugale*, or cheek-bone Q. Fig. 3 and 4.

In order to preſerve the true form and relative ſituations of the parts, I did not view them from one fixed point, but

* Pliny calls theſe ſide-drawings *catagrapha*, and *imagines obliquas*. He attributes the invention to the celebrated Cimon Cleonæus. — See Lib. XXXV. Cap. viii. p. 690.

my eye was always directed, in a right line, to the central point of the object, in the manner practiſed by maſons and architects; avoiding the rules of perſpective, by which particular parts are always diſtorted and miſplaced. I viewed the object with only one eye.

To facilitate this buſineſs, I invented a machine ſufficiently large to receive the largeſt ſkull. It conſiſted of an horizontal quadrangular table, upon which was placed a perpendicular frame, that was alſo quadrangular. In the laths which completed this frame a number of holes were bored parallel to each other; ſo that threads could be drawn through them, and be faſtened in every direction required. By theſe I was able to make horizontal, perpendicular, or oblique lines at any convenient diſtance from each other.

The fore part of the ſquare table is alſo divided into equal portions, by means of braſs pegs, correſpondent to the holes made in the upper part of the frame, that lines may alſo be drawn by means of threads obliquely downwards: thus may the true point of viſion be obtained, by placing the eye in ſuch a direction, that the oblique thread may perfectly coincide with the perpendicular one.

The table before me being elevated to ſuch a height that my eye became parallel with the horizontal line A. B. I placed the ſkulls, by the ſide of each other, on the table behind the perpendicular threads of the frame. By extending the oblique threads in ſuch a manner as to make them paſs over

the principal parts, and by means of the perpendicular lines, I was ſecure of all the points requiſite to afford me an accurate drawing.

It was in this manner I diſcovered in all the figures, that the lines N D. and E F. interſect each other in C. before the aperture of the ear; and alſo the point of contact of the front teeth was at N. and of the occiput at D; by which the ſize of proportion of N C. to C D. that is, the relative diſtances from the extremity of the fore teeth to the aperture of of the ear, and from thence to the extreme part of the occiput, became manifeſt.

The great utility of this method will fully appear hereafter. I ſhall only remark at preſent, that the point C. generally coincides in the human ſpecies with the line of gravity of the whole body (ſee Plate Second, E F. or E F, e.) and thus in the centre of the head's motion: which is in the place of union of the condyles of the occiput with the firſt vertebræ of the neck. See P W. in the third and fourth figure of Plate I. or W. in Plate II.

By means of the ſame inſtrument, the exact height of the heads could alſo be aſcertained (ſee E F. in all the upper figures of Plates I. and II.) and alſo the proportionate ſize of E C. that is, of the head from the vertex or crown, to the aperture of the ear, compared with C F. or the diſtance from this aperture to the lower edge of the maxilla: likewiſe the proportions between H N. and N I. or the relative diſ-

tances from the line of the vertex to that which paſſes under the noſe; and from this to the lower edge of the maxilla. It alſo marks the ſquares H, I, L, K, in which theſe heads were delineated.

Further: As the cloſing of the teeth marks the mouth at G. I was able to draw an oblique line from G. to M. along the naſal bone ▵, and the forehead T. This, upon account of its great uſe in diſcriminating the difference of faces, may properly be termed the *linea facialis*, or the facial line.

The firſt figure of the firſt plate repreſents the exact profile of a *ſimia caudata*, or tailed ape. I do not recollect the particular ſpecies. It had a flat forehead, which was ſomewhat elevated above the rim of the eye-ſockets: It had five double teeth, and facculi; ſo that it was a native of Africa. The facial line M G. makes with A D. the angle M N D.; which is equal to 42 degrees.

N C was to C D : : 8 : $2\frac{1}{2}$ or : : 16 : 5.
E C : C F : : 7 : 7. that is, E C = C F.

Or, in more familiar terms,

The diſtance from the mouth to the orifice of the ear, was, compared with the diſtance of this orifice from the bottom of the lower jaw, as 8 is to $2\frac{1}{2}$, or 16 to 5: and the diſtance from the vertex to the orifice of the ear, was preciſely equal to the diſtance of this, from the baſis of the lower jaw.

The ſecond figure is drawn from a ſmall orang-outang, reduced to one fourth of its natural ſize. It is the ſame that I had delineated and deſcribed in a former Treatiſe*. It was very young, and had not more than two double teeth.

The facial line M G. made with A B. or N D. an angle of 58 degrees: N C. compared with C D. was as 7 to 4.; and E C. compared with C F. nearly as ſix to four.

The high forehead of this animal gives it a greater reſemblance to the human ſpecies; and the ſockets of the eyes are more elevated; which communicates a more animated appearance to the eyes themſelves.

Edwards, who has but imperfectly delineated this ſpecies of ape †, gives to the facial line an angle of 55 degrees. This ſmall difference may be overlooked, as much greater are perceived in the human ſpecies.

The real pongo has been lately diſcovered in the Iſland of Borneo; and a deſcription of it is given in the Batavian Tranſactions ‡. This animal is, upon the whole, of a ſimilar figure to the other; but it is about twice the ſize. I have in my poſſeſſion the ſkull of one that was four feet five inches

* Natuurkundige Verhandeling over den orang-outang. Amſt. printed for Erven and Meyer. Plate II. Fig. 1 and 2.

† Gleanings of Nat. Hiſt. 1758. Tab. 213.

‡ Vol. II. p. 245.

in height; whereas the ſmaller ſpecies ſeldom exceed two feet and a half. This however has leſs of the human form, as its fore-head is flatter, the cheek-bones are broader, and the jaw-bone projects farther. The facial line makes with the horizon an angle of 47 degrees.

The cranium of the young negro, repreſented in the third figure of the firſt plate, immediately indicates the human countenance. He was changing his teeth; as may be known by the ſecond grinder and a lower inciſive tooth that were fallen out; and the ſucceeding teeth were advancing. He had only four teeth on each ſide. I diſſected the body of this youth publicly at Amſterdam, in the year 1758.

The facial line M G. made an angle of 70 degrees with the horizontal line N D.

N C compared with C D was as $7\frac{3}{4}$ to 8, or as 31 to 32.
E C : C F :: $8\frac{1}{2}$: 5, or as 17 : 10.

The projecting point of the jugal, or cheek-bone, Q. was in the centre between the mouth and the orifice of the ear; that is, N Q : Q C :: 4 : 4. or N Q = Q C. It is the projecting part Q. which gives the degree of flatneſs to the face. This is ſtrongly marked on the medal of Bocchus, King of Mauritania. See Plate X. Fig. 1. and 2.

Albert Durer, having occaſionally delineated a Moor, in his treatiſe on the changes of the facial line in different

countenances, has made the facial line correſpond with that of ours: its inclination being about 69 or 70 degrees.

The antients ſeem to have paid great attention to the facial line. This is particularly obſervable in the *Recueil d'Antiq.* of Count Cæylus *. In ſome of the plates, the head of a negro is repreſented upon an ornamental lamp, with ſingular accuracy.

The fourth figure of our firſt plate repreſents the head of a Calmuck. As the teeth and under jaw were wanting, I have been obliged to ſupply the deficiency from the cranium of an aged negro, the ſize of which was nearly ſimilar.

The facial line M G. made alſo an angle of 70 degrees with the horizontal line N D. N C : C D. was as 11 :: $7\frac{1}{4}$ or as 44 : 29. and E C : C F :: $10\frac{1}{2}$: 6. or 21 : 12. Q C = 15. And thus N Q : Q C : : 7 : 15. That is,

The diſtance from the extreme projection of the teeth to the orifice of the ear, compared with the diſtance of this from the extremity of the occiput, was as 11 to $7\frac{1}{4}$, or as 44 to 29. The diſtance from the vertex to the orifice of the ear, compared with the diſtance of this orifice from the

* See Tom. VII. Pl. li. Fig. 1 and 2. and Pl. lxxxi. Fig. 5. alſo Part V. Pl. xc. Fig. 2.

lower edge of the inferior maxilla, was as $10\frac{1}{2}$ to 6, or 21 to 12. The moſt projecting part of the jugal bone, from the orifice of the ear, was equal to 15; that is, the diſtance of the mouth from the proceſs of the jugal bone, compared with the diſtance of this from the orifice of the ear, was as 7 to 15.

From a large collection of European heads in my cabinet, I have ſelected the one repreſented in the ſecond Plate, figure the firſt. In this, as well as many other which I meaſured with care, the facial line M G. made an angle of 80 degrees with the horizontal line N D. or A B. The proportions were as follow:

N C was : C D :: $7\frac{1}{2}$: $7\frac{3}{4}$, or as 30 : 31. E C : C F :: 9 : $5\frac{1}{2}$. or as 18 : 11. N Q : Q C :: $3\frac{1}{2}$: 4. or as 7 : 8.

It follows from hence, that the angle of the facial line has in nature a *maximum* and a *minimum* from 70 to 80 degrees; which deſcribe its greateſt or ſmalleſt degree of elevation. When the *maximum* of 80 degrees is exceeded by the facial line, it is formed by the rules of art alone: and when it does not riſe to 70 degrees, the face begins to reſemble ſome ſpecies of monkies. This will be fully explained hereafter.*

To proceed with as much perſpicuity as poſſible, I ſhall place the facial line M G. erect in the perpendicular line

* See Part III. Chap. ii. of this Treatiſe.

H I. See Plate II. Fig. 2. The angle is now become 10 degrees larger, and the cavities of the eyes, cheek-bones, &c. are brought forwards and nearer to N M.

Imagine a cranium of a pliable conſiſtence, and that the occiput could be preſſed forwards and upwards; then muſt E C. or the diſtance from the aperture of the ear to the vertex increaſe, and again the ſpace E Y.; although the cavities of the eyes, and the eyes themſelves, will ſtill remain in the line T U.

The line S V. which marks the oblique direction of the lower jaw, riſes alſo in the ſame proportion, until it approaches to D.; until it coincides with D. as in Figure 3. or riſes above it, as in Fig. 4. of the ſame plate. On the other hand, the diſtance between T X.; that is, between the facial line and the perpendicular line that paſſes from the vertex by the orifice of the ear, gains as much as X U. has loſt. The head becomes gradually narrower alſo in proportion as the facial line riſes and inclines forwards into the 100th degree; which is the *maximum*, or utmoſt that the artificial line will permit. In this caſe the eyes, placed in the centre of their cavities, are exactly in the middle of the head, or at an equal diſtance from the vertex and the bottom of the chin. See Figure 4. of the ſame plate.

If the projecting part of the forehead be made to exceed the 100th degree, the head becomes miſhapen, and aſſumes

the appearance of the hydrocephalus, or watery head. It is very ſurpriſing that the artiſts of ancient Greece ſhould have choſen preciſely the *maximum*, while the beſt Roman artiſts have limited themſelves to the 95th degree, which is not ſo pleaſing; as the compariſon of the 3d and 4th Figures of this Plate will evince.

The two extremities therefore of the facial line are from 70 to 100 degrees, from the negro to the Grecian antique; make it under 70, and you deſcribe an ourang or an ape: leſſen it ſtill more, and you have the head of a dog. Increaſe the *minimum* and you form a fowl, a ſnipe, for example, the facial line of which is nearly parallel with the horizon; that is, both the maxillæ will be lengthened, and the lower maxilla will gradually loſe its angle C V S. No ſpace is now left for teeth; which explains the reaſon why fowls are deſtitute of teeth.

I have ſometimes amuſed myſelf with making theſe gradations upon a ſmaller ſcale, by ſketching them on a long ſlip of paper; which exhibits a ſingular appearance. It is not neceſſary to give a ſpecimen, as they can be eaſily made by every one ſkilled in drawing.

If attention be given to the angle M G S. which deſcribes the angle formed by the facial line and the lower extremity of the chin (ſee the four Figures of the Firſt Plate) it will be immediately perceived that this becomes larger, *i. e.* more rectangular, in proportion as the facial line M G. aſcends; it is

therefore the largeſt in a European (as in Fig. 1. Plate II. G I.); and that it projects forwards with the facial line, which it always follows, as in Fig. 2, 3, 4. of Plate II. In this ſituation the angle of the lower jaw becomes more erect, the diſtance from I. to F. becomes leſs, and V. is rounder. It is this which makes the maxillæ of the antique heads rounder and more graceful; as will appear in the 4th Fig. of the ſecond Plate.

The eyes, which are placed nearly in a line with the upper edge of their ſockets, gradually recede in an European and the antique; that is, S r. or the diſtance from the eye to the ridge of the noſe, gradually becomes greater. See the 2, 3, and 4th lower Fig. of Plate II. This gives a certain elegance and dignity to the countenance of the antique, which cannot be otherwiſe acquired.

It is plain, if the cavity of the eye remains at the ſame diſtance from the perpendicular line I H. and the forehead be made to project forwards, that this depth or diſtance will increaſe according to the degree of projection. See the ſame Plate and Figures.

If I am not deceived, the ſize of the mouth is in proportion to the diſtance of the *dentes canini*, or eye-teeth, in men and animals, with only a few exceptions. Or, to ſpeak more properly, the angles terminate at the commencement of the firſt double tooth, or grinder. Many animals have not the eye-teeth.

In apes therefore, in the orang, and in the negro, the rim or angle of the mouth muſt be more diſtended than in an European, as the projection of the upper jaw enlarges the diſtance. For the ſame reaſon, the mouth of the antique will be the ſmalleſt.

The central line of the ear is, in all perſons, ſomewhat inclined, as I have repreſented it in Figures 3. and 4. of the ſixth Plate. It is never parallel with the facial line in white men. It is, however, in the negro; as is apparent from the third figure of the firſt Plate.

I have placed the central line of the ear perpendicularly in the ſecond Plate, that the true diſtance of the eye from the ear may be more accurately aſcertained.

CHAPTER IV.

REMARKS CONCERNING DIFFERENCES IN THE FACIAL LINE, AND THE CHANGES WHICH NECESSARILY ARISE FROM THENCE.

IN the preceding chapter, I have ſimply ſhewn the kind of angle which the oblique line M G. makes in all the figures of the firſt and ſecond Plate. Let us now pay attention to the triangle T G S. of Plate I. Fig. 3. and 4. and it will appear that this triangle is not remarkably large in the European, repreſented in Plate II. Fig. 1. In the ſecond figure of this ſecond Plate it is totally effaced: in the third the angle becomes *minus*; and in the fourth the *minus* is increaſed.

Let us now ſuppoſe that all theſe heads were of an equal ſize, and that the noſe of each projected to an equal diſtance from the line or ſurface T S. (Plate I. Fig. 3. and 4.) it is manifeſt that the noſe of the negro and Calmuck will ſeem to be leſs, and, as it were, preſſed inwards.

The noſe of the European (Plate II. Fig. 1.) will appear ſomewhat bent, and alſo to project farther than the upper lip. In the face of the antique (Fig. 4.) the noſe will be nearly in a perpendicular line with the forehead, and project but a little from the lip.

The lower jaw, as well as the upper, is alſo much forwarder in the negro, Caffre, and Calmuck; and therefore it is that theſe people approach nearer to the figure of an ape

than either the European or the antique. The lines m g s. are nearly the ſame with the lines M G S. Compare the lower ſketches with the upper, in Plate I. Fig. 2. and 3.

In a Calmuck, the upper jaw is very flat before, becauſe the cheek-bone Q. (Plate I. Fig. 4.) being very large, nearly advances to the perpendicular line T T. that is, directly over the middle molaris or grinder. In the Chineſe, Otaheites, and other orientals, the cheek-bone Q. correſponds with the diviſion between the third and fourth grinder hindwards.

In the negro, C Q. is obviouſly ſhorter, and the line falls behind the third grinder. In the European, Q. is behind the fourth grinder; and in the antique head, it comes yet more forwards. Hence it follows that the features of antiques, thoſe of Apollo, for example, muſt be flatter than ours; and, on the other hand, thoſe of Aſiatics and Africans ſtill flatter; and thoſe of the Calmucks the flatteſt of all.

The diſtance from N to G. *i. e.* from the undermoſt part of the noſe to the union of the upper and lower teeth, is greater in a Calmuck than in a negro; and in him greater than in us. On the contrary, N G. is very ſhort in an Aſiatic. The lips muſt neceſſarily be longer and thicker in proportion to this diſtance; and therefore is the upper lip the longeſt and thickeſt in a Calmuck, and the ſmalleſt in the antique.

If attention be paid to what may be called the Suſpenſion of the face, *i. e.* the diſtance of P F. (Fig. 1, 3, and 4. Plate I.)

or the axis upon which the head moves from the line of the lower maxilla I L. in a negro or Calmuck (Plate I. Fig. 3. and 4.) or the European (Plate II. Fig. 1. W.) it will appear that the maxilla and the chin are deeper or lower in the two former than in the latter. The condyle alſo, or prominence on which the head turns, is in the ſame line, as the union of the teeth of the upper and lower jaw. See Plate I. Fig. 3. W G. Hence it follows that the neck of a Calmuck is ſhorter than that of an European: or rather, that it appears to be ſhorter, becauſe the lower jaw, or chin, ſinks ſo much lower. In proportion as the chin is lower, the condyle of the neck ſhorter, and the ſhoulders raiſed in conſequence of the length of the clavicle (as is the caſe with the orang, and with all deformed perſons) will the head ſink more upon the breaſt; and the ſtronger will be the reſemblance to the people who are denominated Acephali; and who are ſaid to exiſt in Guinea.

Again: As the *foramen magnum* of the occiput is not always placed at an equal diſtance from the perpendicular line K L. and as the condyles are placed in an oblique direction before and on each ſide of the *foramen*, it follows, that the centre of motion of the head will vary conſiderably in different people. The line N D. extended from the extreme point of the mouth to that of the occiput, may be compared to a lever, of which the centre of motion is in C. Now, in proportion as the diſtance from N to C. is increaſed, will the face project forwards, and the neck will appear ſhorter.

The following appear to be the different proportions. In the Calmuck is N C. or the diſtance from the extremity of the teeth to the orifice of the ear, compared with C D. or the diſtance from this orifice to the extreme part of the occiput, as 12½ to 6 : or nearly as 2 to 1.

In the negro is N C : C D :: 7½ : 8½ :: 15 : 17
In the European is N C : C D :: 7½ : 7½ :: 1 : 1
In the antique is N C : C D :: 7½ : 5½ :: 15 : 11

The heads of the Calmucks muſt of conſequence incline forwards, and ſink upon the ſhoulders.

The heads of negroes incline backwards, as the heavieſt part is behind the centre of motion.

The head of the orang-outang muſt be more forwards than that of the Calmuck, for the reaſons given; and the head of the ape, the dog, horſe, &c. ſtill more than either of theſe.

The heads of the Europeans remain in an equipoiſe; which gives them ſomething of an haughty mien.

In the antiques the gentle inclination of the head, particularly in the ſtatues, communicates the moſt ſtate and dignity to the countenance.

Since I began to compoſe this Treatiſe, I have been able to procure the entire cranium of a Chineſe, who died in the

flower of his age *. The facial line was 75 degrees. The cavities of the eyes were in breadth, compared with their height, as 12-8ths to 9-8ths = 1 $\frac{1}{2}$ d. In the European they are equal. It is not ſurpriſing, therefore, that the countenance of the Chineſe ſhould have a melancholy aſpect, and that the chinks or fiſſures formed by the upper and lower eye-lids are naturally ſo long.

Their ſuperior maxilla is narrow; that is, the ſpace from N. to C. is very ſmall; ſo that they cannot have a large lip. However, the lower jaw is of a more quadrangular form than in the European or the negro. In the Chineſe it makes an angle of 110 degrees; in the European, of 120; and in the negro, 125. See S V W. in Plate II. Fig. 1. and Plate I. Fig. 3. The lower jaw of the Chineſe has, upon this account, ſomething of the ape, and particularly of the orang, in its form.

I took a ſketch of the entire cranium of an Otaheite, who was brought into Europe by Captain King, when I was at

* In the Chineſe, the length of the head, from N. to D. is equal to its height E F. The difference between N C and C D, is as 4 to 3. The line E F paſſes through the condyles of the occiput; ſo that N W is equal to W D.

Although the cranium of the Chineſe is not delineated in theſe plates, yet the letters have ſimilar references, as in the firſt and ſecond Plates. However, it muſt be remarked, that N C in this place denotes the diſtance from N to the orifice of the ear C, and N W the diſtance of C from the middle of the condyles of the occiput.

M. D'Aubenton, *Mem. ſur les differences de la ſituation du grand trou occipital dans l'homme & dans les animaux*, has many curious and juſt obſervations upon this ſubject. — See *Mem. de l'Acad. Roy. des Sciences de l'Annee* 1764, *imprime* 1768. 8vo. p. 935.

Oxford, in the year 1785, which has a very great reſemblance with that of the Chineſe. The facial line was, however, perpendicular; which may have been incidental. In the cranium of an iſlander of the Celebeſe, are the ſame peculiarities as in that of the Chineſe.

In the cranium of a man of the Celebeſe, and one of a Macaſſaar, which I poſſeſs, there is a complete ſimilarity; more than with that of a Moguller; which has, notwithſtanding, much of the Aſiatic in its form.

It is amuſing to contemplate an arrangement of theſe, placed in a regular ſucceſſion: apes, orangs, negroes, the ſkull of an Hottentot, Madagaſcar, Celebeſe, Chineſe, Moguller, Calmuck, and divers Europeans. It was in this manner that I arranged them upon a ſhelf in my cabinet, in order that thoſe differences might become the more obvious which I have deſcribed in the preceding chapter.

To perceive at once the great utility of theſe principles, let any perſon ſketch the profile of a negro, as in Plate VI. Fig. 1. reſembling the one delineated in the third figure of the firſt plate; the outlines of which are marked in the ſixth plate by the letters K A, B, H, I, L, M, then draw the facial line of an European along the forehead F E, of 85 degrees; which will direct him to ſketch from A to N E and O, and to terminate in I, and he will immediately have the face of an European.

Or let the face of an European be firſt ſketched; and by inverting the mode, the phyſiognomy of a negro will be obtained.

By covering the dotted line A B H, with the tips of the fingers, the European face becomes more conſpicuous: on the contrary, by covering N E O, the negro will more perfectly appear.

CHAP. V.

PHYSIOLOGICAL EXAMINATION OF THE DIFFERENCE IN THE FEATURES, WHEN VIEWED IN FRONT.

THE third plate exhibits, at firſt glance, the principal differences between the Negro, Calmuck, and European, as copied from Nature; and alſo the head of a Pythian Apollo, drawn according to the principles advanced, and which will be more fully conſidered hereafter.

The orang-outang that was repreſented in profile, in the ſecond figure of the firſt plate, is now placed in front, that the breadth of the jugal or cheek-bones M N. may be more accurately compared with the breadth of the head at P O. and that the ſmall ſpace between the eyes Y Z. may be compared with that in the Calmuck.

In the orang, the length of the head I H. compared with its greateſt breadth, at P O. is in the proportion of 19½ to 14: and P O. compared with the breadth of the cheek-bones M N. as 14 to 14, that is, equal. M N. compared with the breadth of the temporal bones X W. is as 14 to 10½.

The reader will perceive that all the correſpondent parts are placed upon the horizontal line A B. and that the height of each is alſo adapted to the ſcale of its profile.

Let us now examine the negro, Plate III. Fig. 2. This head, in length, compared with its breadth, is as 27 to 20: that is, I H : O P :: 27 : 20. But O P : M N :: 20 : 18. and M N : X W :: 18 : 16. The lower jaw U V. is as 12. Thus does the whole face gradually diminiſh from P. in the direction of M V. to H. and O N U H, retaining much of the oval form. The apertures of the noſe are very wide, compared with the length of the noſe: ſo that E F. is to D C. as 2 to 3. It neceſſarily follows, that the pinnæ which are formed to cover theſe apertures, will be expanded on each ſide, and the noſe will be very broad.

The diſtance of the cavities of the eye Y Z. is as 3; ſo that the eyes exceed in nearneſs to each other the breadth of the noſe: and the pinnæ, which are placed at the ſide of E F. will be at leaſt as 4 in breadth.

In this negro, the diameter of the eye-ſocket from the forehead downwards, was very large: that is, K L. was equal to 6: ſo that the eye might have been large. In others I have found the cavities ſmaller; as alſo in the Chineſe. There is alſo a great difference among Europeans in this reſpect.

When I drew lines from the upper edge of the ſmall naſal-bones at C. over the broadeſt parts of the noſe at E F. down to Q and R. the four *dentes inciſorii*, and the two *dentes canini*, or eye-teeth, were incloſed between them. Now as the mouth always covers the eye-teeth, Q R. will neceſſarily limit the breadth of the mouth. In proportion as the diſtance

from Q to R. is great, compared with the breadth of the maxilla at V U. will the mouth appear ugly and diſproportioned; Q R. is nearly as 8, and V U. as 12.

Negroes have ſmall ears; but as the mammillary proceſſes are the breadth of the cheek-bones M N. they ſtand off from the head. This is obſervable in all negroes.

The Calmuck is very differently formed. (Plate III. Fig. 3.) The proportions are as follow:

The height of the head I H. compared with its breadth at O P. is as 16 to 10, or 32 to 20.

O P. compared with M N. the projection of the jugal-bones, is as 20 to 24.

M N. compared with X W. the temples, is as 24 to 19.

U V. the lower jaw, is as 8 or 16.

This face has alſo ſomething of a lozenge or rhomboidal form. It is narrow and pointed towards the crown; becomes broad at O P. is the broadeſt at N M. and becomes ſuddenly ſmall at U V. This has been already remarked by La Loubiere.

The apertures of the noſe E F. are as 2¼; ſo that the pinnæ cannot be very broad; but the openings in the noſtrils

are very conſpicuous; as will be obvious by comparing the cranium with the face, in Plate I. Fig. 3.

The diſtance of the eye-ſockets Y Z. is very ſmall; ſo that the eyes ſtand much cloſer together than in the negro.

The diameter of theſe cavities at K L. compared with I H. or M N. is alſo very ſmall; and as the *muſculi rotundi* always lie upon the jugal-bone, the fiſſure muſt be oblong; at leaſt muſt appear ſo, as the pleats or wrinkles in the ſmaller canthus or angle ſeem to lengthen it. In the Chineſe the eye-ſockets are broader than they are high: hence they have long eyes.

The triangle C Q R. drawn in the ſame manner as in the negro, deſcribes Q R = $3\frac{3}{4}$; that is, includes the four *dentes inciſorii*, and the half of the eye-teeth. The other portions being added, the mouth will become = 4 and ſeven-eighths, or nearly 5.

Since the cheek-bones are remarkably broader than the head; that is, M N : O P :: 12 : 10. the ears are almoſt hid behind them; as in apes, and particularly in that deſcribed in Fig. 1. of this plate, which has alſo a ſtriking reſemblance to the Calmuck, in the narrow ſpace between the eyes, breadth of the jaw-bones, and flatneſs of the face.

Very different from thoſe in the Calmuck are the proportions

obſervable in modern Europeans; particularly in our own countrymen: for

I H : P O : : 29 : 23.
P O : M N : : 23 : 20.
M N : W X : : 20 : 17.
M N : U V : : 20 : 13.

our faces therefore have the form of an oval, which is ſhorter in proportion to its breadth than that of the negro.

The diſtance between the edges of the eye-ſockets Y Z. being equal to the breadth of the naſal apertures E F. our eyes are placed at a greater diſtance from each other: and as the diameter of theſe ſockets K L. are = 3, there is ſpace for large eyes. But the pinnæ of the noſe are broader than the ſpace between the eyes.

The ears are cloſer to the head, in conſequence of O P. the parietal-bones being ſo much broader than the jugal-bones M N. This will be clearly underſtood from what has been advanced concerning the negro and Calmuck.

The triangle C Q R. being longer, and the diſtance from the upper part of the naſal-bone C. to the junction of the teeth at G. being greater; thus is the mouth Q R. obviouſly ſmaller; E F. in the European being equal to E F. in the negro; that is, 3. The mouth Q R. moreover is to U V. equal to 6, compared with 13.

In antiques, the facial line M G. being made to project (ſee Plate II. Fig. 4.)—the crown becomes more elevated, and riſes from Y to E. which is equal to the degree of projection at M H. Hence it is that in the fifth figure of this third plate, the head of the antique is made ſo high, although it is formed after the ſame model. Artiſts have alſo made M N. (the jugal-bones) equal to P O. (the parietal-bones) in breadth: the occiput is narrower, the maxillæ ſmaller, and the eyes are placed at a greater diſtance from each other. In the antique the following proportions are obſerved:

I H : P O : : 33 : 20.
M N : W X : : 20 : 17.
M N : V U : : 20 : 16.

conſequently the face is in the form of a more oblong oval.

The antients divided P O. into four equal parts; one for each eye, and one for the diſtance between the eyes; P O = 3 = Y Z: whereas it was only 2 in the modern head.

The noſe alſo inclining forwards, as repreſented in the lower ſketch (Plate II. Fig. 4.) it is proportionably longer (ſee T h.); and the upper lip becomes proportionably ſhorter.

The naſal apertures remaining of the ſame width as in us, the pinnæ are equal to Y Z. or the ſpace between the eyes; and alſo to the ſize of the mouth Q R.

Through the projection of the facial line, the eyes are deeper ſeated; and the middle line which runs acroſs the angles of the eyes O P. divides I H. into two equal parts at d; but this takes place alone when M G. the facial line, makes an angle of 100 degrees with A B. which is the *maximum* of its inclination. See Plate II. Fig. 4.

CHAPTER VI.

DIVERSITY OF FEATURES IN THE COUNTENANCES OF DIFFERENT PEOPLE, NATURALLY EXPLAINED.

WE have already enumerated, in the ſecond chapter, all the cauſes alledged by ancient and modern writers of the diverſities of make obſervable in the human countenance, and we have added our opinion to that of the acute naturaliſt Count de Buffon, that the climate, under which we include the influence of air, of food, and cuſtoms, is of itſelf ſufficient to give ſome particular and appropriated form to the bones; and conſequently to the ſofter parts. When we add the different diſeaſes peculiar to ſome countries, which co-operate with the above cauſes, we ſhall not be ſurpriſed that a ſimilar diverſity ſhould be found in the human ſpecies diſperſed over different parts of the globe; as may be obſerved in plants, fowls, quadrupeds, &c.

It has, we hope, been fully demonſtrated, that in the negro, the upper maxilla naturally projects remarkably forwards; and that in conſequence of that formation, the line M G. inclining backwards, makes an angle of 70 degrees; as repreſented in Plate I. Fig. 3 and 4. Hence it neceſſarily follows, that the fore-teeth muſt alſo project; and that, to cover theſe, the lips, particularly the upper lip, muſt be long, thick, and broad; and the under lip muſt alſo be conformable to the

other. The noſe advancing farther than the line T S. in a ſimilar proportion (ſee Plate I. Fig. 3) muſt appear, from the jutting out of the upper lip, to be preſſed inwards. No art is required to produce this appearance; nor was it requiſite for mothers or midwives to ſqueeze in the one, or ſtretch out the other.

The width of the naſal aperture in the cranium, requires the noſe to be broad; and that the pinnæ, which are placed externally, ſhould be proportionate to the apertures in the bony parts. Why have not philoſophers and travellers, who ſuffer themſelves to be deceived by idle tales, informed us that the negroes made the ſides of their noſe ſpread, by means of ſome compreſs? Their accidentally ſtriking them againſt the backs of their mothers might, perhaps, flatten the cartilaginous part, but could not enlarge the noſtrils on each ſide with ſuch perfect ſymmetry.

The flatneſs of the face depends upon the extention of the jugal-bone, from C to Q. Plate I. and II. Hence it is clear to a demonſtration, that the faces of the eaſterns were not rendered flat by artificial compreſſion, but that they are ſo from natural cauſes; at leaſt they appear flat when compared with our own.

It has alſo been ſhewn, that in the negro, the back part of the head is heavier than the fore part; that is, C D E. is heavier than E. T. G. S. P. C. Plate I. Fig. 3. The negro, therefore, naturally throws his head backwards, particularly

young perſons; while the neck is protruded forwards, and the loins bent inwards, in order to maintain an equilibrium.

It is from this cauſe that they have ſmall hips, and that the pelvis is generally narrow. Its breadth, compared with its depth, is in the proportion of 9 to 7; while in moſt other men, who are well formed, it is as 11 to 7. As the negroes with whom we are beſt acquainted have been ſlaves, and been compelled to hard labour from their tender years, their knees become bent in an inward or outward direction; and hence it is that ſo many of them have crooked and misformed legs.

Many other cauſes might be added, upon which I ſhall not enlarge, as it is not my plan to give a minute deſcription of the whole body.

What has been advanced will ſufficiently demonſtrate, that art has no more influence in changing the features than in changing the colour, or in criſping the hair; and that to Nature alone theſe differences muſt be aſcribed.

For ſimilar reaſons is the face of a Calmuck, Chineſe, and Siameſe, flat, the noſe ſmall, the noſtrils open and expoſed. Their lips will be larger or ſmaller, according to the ſize of the upper maxilla.

Let us admit for a moment, that the ſides of their heads were preſſed between planks, according to the narratives of

ancient authors, whence is it that the jugal-bones ſpread out ſo much? They alſo muſt have been compreſſed. From what cauſe is the diſtance between their eyes ſo ſmall? If this proceeded from their being preſſed cloſer together, the upper jaw, inſtead of being much broader than with other people, muſt alſo have become flatter at the ſides.

As C Q. is ſo long (ſee Plate I. Fig. 4.) and the back part of the head C D E. ſo ſmall, compared with its oppoſite E T G S C. the head muſt neceſſarily hang over, and the ſubject become round ſhouldered; that is, directly oppoſite to the form of the negro. The head will alſo ſink between the ſhoulders, as in the orang, and other ſpecies of apes.

The head of the Calmuck is decidedly greater than ours, while their body is ſmall. Beſides, they cannot walk perfectly upright, and their knees are ſomewhat extended in the manner of our porters when they carry a heavy load on their heads. This muſt render their figure diſagreeable in our eyes, who are accuſtomed to ſee tall perſons 7 or 8 times the length of their heads; whereas this people, the inhabitants of Lapland, of Brazil, and ſome other countries, are ſcarcely the length of ſix heads in their ſtature. Moſt of theſe people ſit upon the ground, without uſing chairs, whence they naturally ſtoop more; and not only appear ſhorter, but, according to our ideas, more deformed.

In an European, the inclination of the ſuperior maxilla being the ſame with that of the facial line, which forms an

angle of 80 degrees (ſee Plate II. Fig. 1.) the noſe becomes larger. Should we not deem it very ridiculous, if a travelling or philoſophic negro, or Calmuck, in deſcribing the particular forms of our features, were gravely to aſſert, that our midwives, mothers, or nurſes, pulled us by the noſe during our infant days, in order to give it the requiſite length?

It is obſervable, that the inhabitants of theſe Dutch provinces have very broad heads; that is, broad from O to P. Plate III. Fig. 4. This proceeds from the weak ſtate of the bones during infancy and childhood. Hence it is that our foreheads are frequently high, flat, and broad, while the lower part of the face is ſmall and delicate. Both the upper and lower maxilla are with us extremely ſmall. The hips are broad in both ſexes, which occaſions a waddling motion, and renders our countrymen leſs agile than thoſe who have ſmaller hips. Ancient artiſts followed in this reſpect the character of their ſtatue. In the Farneſe Hercules, the breadth compared with the depth, is made as 12 to 8½. In the Pythian Apollo, it is as 9 to 7. In the Antinous, as 11½ to 8½. The proportions of Alb. Durer are as 9 to 5. In our females the proportion is as 12 to 7. The Greeks have made it, in the *Venus de Medicis*, as 11 to 8½; that is, they have made the body ſmaller, thicker, and more rotund.

In a word, it would be abſurd to acknowledge the influence of art in making the hair ſtraight or curled, the legs thick or thin, the head large or ſmall, among us; and ſurely it is equally abſurd to aſcribe the particulars in the form of other nations to the ſame cauſe.

If any doubt ſhould remain, the following experiment will demonſtrate the truth of my aſſertions. Sketch the figure of a negro (as in Plate VI. Fig. 1.); draw the parallel lines A C. and B D. and the vertical line C. K.; from the extremity of the line D E. make the line E F. forming the triangle F E D. of 85 degrees; delineate a mouth at E a, and it will immediately appear that the noſe of the negro has not been preſſed inwards, but that the maxilla projects too far. By a ſimilar proceſs may an European be transformed into a negro; and the figure will fully evince, that the negroes no more compreſs the noſes of their children, to make them ſmaller and flatter, than we lengthen the noſes of ours by perpetually pulling them.

PART THE SECOND.

CHAPTER I.

CONCERNING THE FORM OF CHILDRENS HEADS, VIEWED IN PROFILE.

THE manner in which all the profiles in the firſt plate were taken, has been already explained. I ſhall merely obſerve, that the profiles in the fourth plate were drawn by means of the ſame inſtrument, and with equal accuracy.

The great difference which exiſts between the head of an infant juſt born, and of one that is a year old, has determined me to make choice of the firſt and ſecond figures. The third figure is delineated after the cranium of a well-formed adult. It is the ſame that was given in the firſt figure of the ſecond plate. The fourth is drawn from a toothleſs old woman, that the eſſential differences may become more conſpicuous.

In the head of a new-born child, the ſkull O G U P. (ſee Plate IV. Fig. 1.) may be conſidered as an oval placed horizontally; to the fore and under part of which the maxilla are affixed. This ſhape is not ſo uniform as to exclude all variations; but theſe are not very great. The lower part

of the chin and forehead are placed parallel to the perpendicular line A D.

In a child one year old, the forehead projects beyond the line A D. and the back part of the head is much enlarged downwards. The upper and lower maxilla are alſo enlarged. Q D. was, in the new-born infant, equal to one-fourth; but in this it is much more. See Fig. 2.

The diameter of the eye-ſocket G H, in the firſt figure, is one-fifth compared with A D. and ſomething more in a child of one year. It is alſo as one-fifth in the head of an adult; but this proceeds from the enlargement of the noſe W. and of the maxilla D. Theſe cavities are in reality much larger in the adult than in the child; which manifeſts that a certain rule is obſerved, although they are much larger in children, in proportion to the difference of age.

As infants are born without teeth, the upper jaw Q R. is very narrow. In the ſpace of a year, it grows nearly as broad again. In the adult, the upper jaw is about three times as large; and, if we include the teeth, it is four times. But there are diverſities in this reſpect, according to the natural ſtrength of the perſon, or national peculiarities.

The upper jaw alſo gradually projects forwards; and the *dentes molares* are completely formed at about the age of twenty years. Q D. or the length of the lower part of the face, is now to A D. as 1½ or 3-8ths. In a child it is only

one-fifth, as in figure the firſt; and three-tenths, in figure the ſecond.

The lower jaw undergoes a ſimilar change. T K. is not only larger, but the point of the angle K ſhoots backwards; ſo that it becomes nearly quadrangular with the condyle T. particularly in the Chineſe and other eaſterns.

The chin at the ſame time ſhoots forwards, as will beſt appear by comparing the third with the two preceding figures. It projects about one-twelfth before the facial line in W. whereas it was about equal with the perpendicular line in the infant (ſee Fig. 1, 2, 3. of Plate IV.); the upper and lower teeth ſpreading, and growing out of both the maxillæ at the ſame time, are regularly oppoſed to each other; yet in the beſt formed heads, the lower teeth are placed within the upper ones.

In children, the ſmall diſtance from Q to H. that is, of the maxilla, and the naſal-bones, from the jugal, gives them a flatneſs of countenance, which is well obſerved by Flamingo. The antients always made the lower maxilla of children too long, and therefore they did not ſucceed in the pleaſing, when they delineated children of a tender age.

The noſe may be diſtinguiſhed into two parts: the one, which has its baſis at W. and which forms the cavity under the forehead O G. and the noſe itſelf, from W to Q. Fig. 2 and 3.

Infants juſt born have no cavity above the noſe and the eye-ſockets (ſee W G.) and therefore they have a flat forehead; that is, the forehead O projects farther than W; whereas in adult perſons the part W projects farther than O; and in aged perſons ſtill more, as in figure the fourth. It is for this reaſon that the noſe of a negro appears to ſink ſo deep, and alſo that it appears to have been much more compreſſed in an aged than in a young negro.

The noſe itſelf is ſmall in children, making about one-fifth of the line A D. In adults it is one-fourth, and broad in proportion.

The head of an infant is longer than it is high: compare D C. with D F. which is equal to A D. In ſome this difference is very great. In figure the ſecond, D C. is about one-fifth longer than D F. but this length ſeems peculiar to the children of theſe provinces, as has been noticed by Veſalius *. We have already obſerved, that the occiput is ſmaller in antiques, from the great projection of the facial line. J. de Wit, however, although he is juſtly celebrated for his painting of children, has not attended to this difference; of theſe he has alſo ſhortened the occiput, and raiſed the vertex. The real form of the head has not eſcaped the notice of Queſnoy; as ſhall be fully exemplified when we explain the fourth figure of the fifth plate.

* Lib. I. Chap. 5.

The centre of motion U, is not in the centre of the head; but it is placed more forwards. Hence it is that the heads of our children cannot maintain an equipoiſe, are prone to incline forwards, and yet more to fall backwards. As ſoon as the line A D. is exceeded, the middle point is changed; and this inclination of the head, ſomewhat forwards, gives it a certain grace.

Alb. Durer has made the facial line of his children to incline forwards, having placed it at 95 degrees; the ſame as in the third figure of our ſecond plate. Queſnoy and J. de Wit have moſtly placed it at 100. In this poſition the head muſt be raiſed, until U W. become equal to S T. See Plate V. Fig. 3.

The *meatus auditorius* enlarges alſo very conſiderably as the infant advances, as well as the mammillary proceſs behind the ear. See Fig. II. Y. While the infant is very young, it is ſeated about the condyle at U. and is ſcarcely viſible; but in adults the mammillary proceſs is very much enlarged, and it deſcends much lower; as in the third and fourth figures of this fourth plate. This is much more obviouſly the caſe in men than in females, in whom none of the proceſſes are ſo ſtrongly marked.

CHAP. II.

THE FORM OF THE HEAD IN AN ADULT PERSON.

THE form of the head in adult perſons has already been fully explained in the third chapter of the firſt part of this Treatiſe; we ſhall only obſerve at preſent, that the growth of the naſal-bone L. (Plate IV. Fig. 3.) gradually communicates a pleaſing form to the noſe, and in ſome perſons renders the whole countenance graceful. Negroes and Aſiatics are deſtitute of this grace; and the Greeks have omitted it. Indeed they were compelled to omit it; for as they make the direction of the noſe nearly perpendicular, they could not give this elevation without producing a degree of deformity.

The diſtance from the fore part of the noſe to the jugal-bone H V. being greater in us than in any other people, the noſe appears longer than it is in reality, particularly in thin perſons; and this prevents our countenances from having a very flat appearance. Our noſtrils are juſt viſible, as the bottom of the noſe h i. (ſee the lower ſketches of Fig. 3 and 4.) is placed horizontally, or parallel to the ground.

The projection of our teeth uſually occaſions a projection of the lips, and the chin ſeems to recede. Every other particular may be collected from what has been already remarked, and from contemplating the figures.

CHAP. III.

THE FORM OF THE FACE IN PERSONS FAR ADVANCED IN YEARS.

OBSERVATION induces me to believe, that, in this country, the women generally loſe all their teeth earlier than the men; but as the men loſe them alſo, the fourth figure of the fourth plate is equally applicable to both ſexes.

Aged perſons not only loſe their teeth, but their gums; that is, the thick margin containing the *alveolæ* or ſockets, in which the roots of the teeth are placed. The roof of the mouth, which was arched in younger years, becomes entirely flat. The lower maxilla alſo having loſt both teeth and gums, is no longer ſo broad. From theſe cauſes is the ſpace within the mouth ſo remarkably diminiſhed, that ſufficient place is not left for the tongue. As it can no longer be drawn up and adjuſted to the arched roof of the mouth, and not having its uſual ſpace, through the failure of the teeth and gums, it is apt to protrude out of the mouth upon the ſlighteſt attempts to move it forwards. The tongue appears, therefore, to be longer than it was (as it is in reality) from its being forced out of a curved line.

The noſe having loſt its ſupport, Q R. (Plate IV. Fig. 4.) bends downwards, and hangs over the mouth: the fall under the forehead W. becomes deeper, while the projecting part is fuller; this renders the furrows, or wrinkles, deeper and

more viſible. The whole of the upper maxilla becomes more concave, and the fore part Q R. which in younger years projected outwards, now contracts inwardly; ſo that the upper lip falls within the margin of the mouth, and the noſe appears much larger than it did in more youthful days.

The lower jaw, which had in its external circuit the form deſcribed by T K D. of the third figure, is now, by the loſs of the teeth, with their *alveolæ*, drawn upwards through the action of the muſcles, until the gums nearly meet. The tip of the chin D. now ſhoots beyond the line Q D. to X. Compare figure the third with figure the fourth of this fourth plate.

The diſtance of the chin from the noſe is ſhorter, by one-ſixth part of the length of the head: the noſe and chin ſeem almoſt to touch each other. This circumſtance is totally neglected by Rubens, De Wit*, and other celebrated painters. Blœmaart aims at following Nature, but he has not juſt ideas of her operations. Laireſſe, P. Teſta, and the immortal Raphael, have followed her with the greateſt attention. J. B. Greuze, the famous French artiſt, ſeems to have totally diſregarded the peculiarity. This is obvious from the plate *Retour ſur ſoi meme*, repreſenting an old woman reading; which has, in other reſpects, very great merit.

When the lower jaw riſes to one-ſixth, as we have already obſerved, the angle of the mouth is drawn downwards, the

* See his Book of Drawings, Plate XI. Fig. 3.

muſcular fibres of the neck become viſible, and are diſtended like cords.

The wrinkles of the face always manifeſt themſelves in a direction contrary to that of the muſcular fibres; hence they are tranſverſe on the forehead, are radiated round the eyes and mouth, and run acroſs the neck parallel to the courſe of the lower jaw X K T. By comparing the cranium with the face (Plate IV. Fig. 4.) it will be obvious that the diſtinguiſhing marks of age are placed in the bony parts, and not in the wrinkles.

To be convinced of the importance of theſe remarks, let the reader delineate a head, according to the firſt figure of the ſecond plate, forming the profile G, H, D, C, L, K. together with the ear, as repreſented in the ſecond figure of the ſixth plate.

Let the projection G, g, h. form the cavity h. above the noſe. By omitting the teeth, the mouth D E. will riſe to d, e. Draw from N. the facial line along g, h, O, P. Place a limb of the compaſs at the point A. and deſcribe from A C. the line C c. till it interſects the facial line at O. Deſcribe in like manner from the point A. the line B b. complete the chin, and let the under lip preſs upon the upper at d, e. Thus will the head of a young man be changed into the form of an aged perſon. The ear M. muſt alſo be raiſed to m. It is, however, to be obſerved, that as the ſkin of the ear in aged perſons becomes relaxed, the ear

itſelf ſeems longer. This ſingularity could not be noted in the figure.

The experiment may alſo be inverted, and the head of a young perſon be formed out of an aged one. By alternately covering the dotted and complete lines with the fingers, theſe different faces will more conſpicuouſly manifeſt themſelves.

CHAPTER IV.

FORM OF CHILDRENS HEADS IN FRONT.

THE ſame heads of children that were repreſented in profile in the fourth plate, are in the fifth plate repreſented in front. Their proportions were taken into conſideration in the firſt chapter of the ſecond part.

The eyes of new-born children are very large, which proceeds from the ſize of the cavities; and they ſtand at a conſiderable diſtance from each other; but this diſtance is not quite the meaſure of an eye. The noſe and mouth ſufficiently indicate themſelves. The head is very flat, becauſe the back part of the head M M. is extremely broad; which is the uſual form of moſt children in this country. The different parts of the face correſpond with the general proportions remarked in the heads of children.

In a child one year old (ſee Fig. 2. of this fifth plate) the eyes are ſtill very large; the lower part of the face is longer, and the forehead is higher. M M. through the weakneſs of the bones, continues to increaſe in breadth. That neither of theſe countenances are very pleaſing, will eaſily be perceived.

The following proportions are obſervable in a child one year old. See Fig. 2. of this plate.

The height of the head A B. compared with the breadth at the external canthus of the eye K K. is as 20 to 12.

A B : M M : : 20 : 19.
A B : R R : : 40 : 19.

the breadth M M : K K : : 19 : 12. P O = 5-4ths; ſo that four times P O = 5, or one leſs than K K. ſuppoſing the eye to be made larger than P O. that is as 1¼, that is 4 ⋈ P O = 6.

In the third and fourth figures I have placed the facial line as in adults, in the 95th and 100th degree of inclination. See S Z. Plate V. To find the angle of the chin, I have made Z. B. equal to U W. Thus the head gains in the height U W. which is equal to S T.

According to theſe limitations, I have alſo ſketched the face, in figure the fifth, in front. A B. is thus equal to 11; and A G. divided into two parts. A D. D G. gives twice D F. in breadth; which is the medium proportion between M M. and K K. of figure the ſecond*.

The head is therefore only four eyes in breadth, which is the true proportion, and not five, as De Wit has repreſented

* The fifth figure is not perfectly accurate: A C. is too high; and D F. rather too ſmall.

the heads of his children in his tenth plate. Alb. Durer, his predeceſſor, has done the ſame; and others have followed their examples. A. Van Dyk has alſo given the proportion of five eyes to the figure of an Infant Jeſus.

The heads of Queſnoy's children perfectly correſpond with the above rules; but the eye-ſockets ſhould have been within the perpendicular line A E. (Fig. 3.) as they project too much; which is not graceful.

PART THE THIRD.

CHAPTER I.

ON BEAUTY, PARTICULARLY BEAUTY OF COUNTENANCE.

NO definition is more difficult than the definition of beauty. Horace, who has treated the ſubject in ſo maſterly a manner, as far as it relates to poetry, conſiders it in a comparative view, and not immediately and abſolutely. Boileau and Pope have alſo ſome excellent obſervations; but theſe are confined to the elucidation of the ſtyle of poetry, by comparing it with painting; or of the latter, by its affinity with the former. Roman, and more modern writers, adviſe us to take the antients for our models; but I recollect none who have explained in what beauty, in itſelf or abſtractedly, conſiſts. Longinus has afforded me the moſt ſatisfaction, as he has treated the beautiful and the ſublime in a more ſyſtematic manner, and has illuſtrated his doctrine by pertinent examples.

Crouſas, Hutcheſon, and Father Andre, have made occaſional obſervations concerning the beautiful. The remarks of Hutcheſon manifeſt taſte and judgment; thoſe of Andre indi-

cate much learning. Formey has prefixed an excellent preface to the works of Andre. Each of theſe authors has made juſt diſtinctions, and ſenſible obſervations, concerning the beautiful; but none of them have informed us what it is that conſtitutes the beauty of a painting, of a ſtatue, or of a building. Like the preceding, they have merely treated the ſubject in a curſory manner, or by way of alluſion.

In every repreſentation, not merely of hiſtorical ſcenes, landſcapes, and ſea-proſpects, but of ſimple groupes, even of ſingle figures, it is neceſſary to diſtinguiſh between poetry or inventive, phyſical or natural, and mechanic or operative beauty. The firſt ſpecies is ſubject to laws which are applicable to poetry in general: the ſecond reſpects the forms of things, the beauty of which it is not eaſy to reduce to any particular rules. Juſt ideas of operative beauty, or the beauty of execution, can only be acquired by practice.

Philoſophers have proceeded farther: they have enquired, What is it that renders us ſuſceptible of the impreſſion of beauty? What is it that renders beauty the decided object of our choice? But although their inveſtigations have manifeſted much depth of thought, the reſult has not been completely ſatisfactory. The celebrated Mr. Burke has clearly demonſtrated, in his excellent Treatiſe on the Sublime, that whatever, both in nature and art, excites apprehenſion or wonder, may partake of its nature. In this ſpecies no rules of proportion can be propoſed as the cauſe of beauty.

The ſtarry heavens, the riſing of the ſun, or a calm ſea, are pleaſing to all. Every one feels a pleaſurable ſenſation at the ſight of theſe objects, and he calls them beautiful. A tempeſtuous ocean, a gloomy foreſt, or even the darkneſs of the night, impreſs us with pleaſing ideas of the grand and ſublime, as Mr. Burke has demonſtrated in a ſtriking manner.

The beautiful in works of art is not always diſtinguiſhed with equal facility. The more they are complicated, the leſs are their beauties diſcernible by the vulgar. Poetic, natural, operative beauty muſt be felt by every one who lays any claim to taſte; and he muſt be able to diſcriminate what is excellent in works of art, from every mixture of imperfection.

It is alone by ſtudy, by contemplating the beſt productions of artiſts, and by forming compariſons, that a genuine knowledge of theſe three ſpecies of beauty is to be obtained. In academies of painting, ſkilful maſters ſhould inſtruct their pupils to contemplate, ſeparately, the poetic or inventive part, the ſketch or deſign, and the execution; and alſo in the manner of correcting any defects that may be conſpicuous.

This ſubject is much too copious to be enlarged upon in the preſent Treatiſe. Our principal object is to contemplate the beautiful, as manifeſted in the human figure, and particularly in the head. I ſhall confine myſelf to the enquiry, Why is a perſon whoſe height is equal to eight heads, deemed a finer figure than one who is only ſix or leſs than ſix heads in height? A Laplander is univerſally conſidered as a leſs

pleaſing figure than a Perſian or a Georgian. Is it becauſe the ſtature of the one will meaſure eight heads, and of the other merely ſix?

It muſt be acknowledged that this difference cannot be aſcribed to any determinate proportion of the parts, ſimply and abſtractedly conſidered; for a child whoſe height is merely equal to four or five heads, is thought as beautiful as an adult equal to eight.

It is, however, acknowledged that the pleaſing is often confounded with the beautiful. We are pleaſed with the playful vivacity, the perfect ſimplicity, the affectionate attachment of a child; we alſo poſſeſs an inſtinctive fondneſs for children; and it is poſſible that we blend all theſe circumſtances in our ideas with the beauty of perſon. It often happens that the figure of a child, abſtracted from theſe conſiderations, has nothing pleaſing in it.

The idea of beauty is ſometimes excited by a certain conformity or proportion of component parts with each other. For example: We ſee with pleaſure that the lower extremities, meaſuring from the pubis to the feet, are preciſely the half of our bodies in length; that the head is one-eighth, the face one-tenth, and the foot one-ſixth.

The head of an Apollo, a Venus, a Laocoon, is univerſally allowed to be finer, or more beautiful, than the heads of our beſt proportioned men and women. Whence does this pro-

ceed? Perhaps it is becauſe, in antiques, the eyes are placed exactly in the centre of the head; which is never the caſe with us. When the breadth of the cheek, from the noſe to the ear, is exactly equal to the breadth of two noſes (which proportion was obſerved by the antients) it is the moſt pleaſing to us; and we prefer thoſe models to others which make the diſtance greater.

To whatever is beautiful in itſelf, and does not depend upon external circumſtances, or mere opinion (and of the exiſtence of this ſpecies of beauty there can be no doubt) ſome relation and proportion between different parts of the ſubject ſeems abſolutely requiſite.

The proportions given by the antients to their figures are not beautiful in our eyes, merely from a weak prepoſſeſſion in favour of all that they have handed down to us, but becauſe they have corrected the defects which ariſe from the laws of viſion. For example:

When the object A B. (ſee Plate IX.) is viewed, ſo that the obſerver ſhall always be at an equal diſtance in E G. or D. whereby E C = G H = D B = A B. (the height of its ſurface) the angle of viſion will always be larger in E. than in G. or in D.

As objects are meaſured according to the angle of viſion, they will appear the higheſt or moſt extended at the point where the line of viſion E C. forms a right angle with it;

that is, when E A C. and E C B. are equal, or rectangular. In this case the angle of vision A E B. is the largest angle.

Suppose the eye to be placed at G. then is the angle A G B. smaller in proportion as the radius A C, A H, A B, is larger; A D B. being equal to one-half of a right angle of 45 degrees.

Thus, as the secant becomes greater, the angle of vision becomes smaller in an inverse proportion, and diminishes the apparent length; that is, E A B. G A B. compared with D A B. must become proportionably less, until A D. the line of section, being infinite, the angle D A B. becomes = 0, or is annihilated; that is, until A D. falls into A B.

Moreover, there is only one point from which an object can appear perfectly quadrangular. For whether the eye ascends along the line D F. above E. or descends towards D. A E B. become smaller, and therefore will the perpendicular side of the object, though perfectly quadrangular, appear broader than it is high.

Hence it follows, that to make the height appear equal to the breadth, the angle A D B. or a D B. must be made equal to A E B. I mean, that A B. must be extended to, or acquire the length of a B.; or, in other words, that the surface A B. which was, we will say, eight feet in height, and equal to its breadth D B. must be enlarged to 10 feet and three-fifths.

Now, as we may ſuppoſe a head, or a complete figure, to be formed of quadrangles, it follows, that a ſimilar imperfection in viſion will take place, that muſt be remedied in a ſimilar manner. For example:

Let A. B. divided into eight equal parts, be made to repreſent a ſtature ſtanding upon a pedeſtal at ſuch an height, that the eye of the beholder at D. ſhall be in a line with the upper edge of the pedeſtal; theſe eight equal parts will appear to the eye under the following angles of vision:

		D.	M.	S.
A 1.	The upper part of the head, under an angle of	3	48	50
1, 2.	The ſecond portion from above, under an angle of	4	18	58
2, 3.	The third portion - - -	4	51	52
3, 4.	The fourth - - - -	5	26	27
4, 5.	The fifth - - - -	6	0	31
5, 6.	The ſixth - - - -	6	31	12
6, 7.	The ſeventh - - - -	6	54	40
7, 8.	The eighth, or loweſt - - -	7	7	30

Hence it is manifeſt, that the head in the higheſt division appears to be of about half the size of that portion of the lower extremities that is contained in the loweſt division.

This will explain the reaſon why the antients ſometimes gave more than eight heads to their figures. The Pythean Apollo has eight heads and an half: a proportion which in itſelf is consonant with all our ideas of beauty.

Were the figures always to be viewed ſtanding upon the ground, it is eaſy to perceive that the apparent ſhortening of the lower extremities muſt be remedied in a correſpondent manner, that the object may appear to be not more than eight feet in height, although in reality it is longer; but when it is placed upon a pedeſtal, or in a niche, the viſual ſhortenings of the upper part abſolutely demand the attention of the artiſt.

Vitruvius ſeems to think the proportions of the human form to be ſo perfect, that he deemed no building beautiful that was not conſtructed after the model of a well-proportioned man*. He alſo limited the proportions of the human body, and its various parts. Theſe proportions are adopted by A. Durer, P. Lomazzo, C. Van Mauder, and others. Hoogſtraaten ſeems to have allowed only ſeven heads and an half; which differs a whole head from the proportions obſerved in the figure of Apollo.

De Wit gave the proportion of eight heads to all the figures of his own composition, to the Pythean Apollo, to the Hercules of Farneſe, and to the *Venus de Medicis*, with a very ſmall variation. If I am not deceived, there is ſomething of a melancholy in all theſe figures, which is not apparent in his own original paintings or drawings. The figure of a female on the title-page of his book of drawings, is nearly nine heads in length. He ſeems in this simply to have ſtudied effect.

* Lib. I. Chap. i. p. 79.

Rubens has ſometimes eight, but moſtly ſeven heads in the proportions of his figures; which is the cauſe of that heavineſs that is ſo conſpicuous in moſt of his works.

P. Teſta has given the proportions of eight heads, and eight and an half to his figures. Bloemaart, whoſe designs are moſtly put into the hands of our youth, is ſo irregular, that he ſometimes gives ſeven, at others ten heads to his figures. C. Van Mauder has proved, that in ſome of the figures of Michael Angelo, the size is equal to nine, ten, nay twelve heads; in order to communicate more grace to a ſtooping attitude.

Moſt of the Italians ſeem to have made their figures, particularly thoſe of females, too ſhort. Modern French maſters render their females more graceful, by giving them the length of eight heads. Watteau began this ſtyle. Probably our ladies wear high heels to their ſhoes, and high head-dreſſes, to produce a similar effect.

The proportion of eight heads pleaſes us, becauſe this is twice the length of the trunk. A door is not pleasing unleſs it be twice as high as it is broad. The French make the doors of their houſes more lofty; which adds dignity, without deſtroying the effects of ſymmetry. For a similar reaſon it is that we hold the Corinthian column to be more graceful than the Ionic. Considering the capital, as in the place of a head, the whole length of a Corinthian pillar is eight heads and an half.

Laplanders, Tartars, Hottentots, and Brasilians, whoſe heads are very large in proportion to their bodies, cannot pleaſe us or be deemed beautiful, no more than the Doric column could be called beautiful upon the revival of architecture. Whoever reads De Roy's Deſcription of the Progreſs of Architecture with attention, will learn that the columns were gradually rendered more graceful. The baſe, on which they were placed, and afterwards the capital, were raiſed until the column, with capital and baſe, had acquired the proportions of the human body.

But to return. It was not my design to enlarge upon the ſubject; we muſt reſtrict ourſelves to the dimensions and forms of heads; and I ſhall now enquire what are the proportions obſervable in the heads of European and other nations.

CHAP. II.

PROPORTIONS OBSERVABLE IN THE HEADS OF EUROPEAN AND OTHER NATIONS, &c. COMPARED WITH THE ANTIQUE IN PROFILE.

IN order to judge with more perſpicuity concerning comparative beauty, in the form of the head, I ſhall give a table of the proportions, as I have found them in the beſt formed heads. I have divided the height of each into four parts, that the length may be aſcertained with greater preciſion. The ſame letters are placed by each figure, that the differences may be the more obvious.

See the ſketches of all the profiles placed under the bones of the cranium.

TABLE

Of the Proportions of all the Heads in Profile.

	Height a d	Length a b	Diſtance of the eye from the crown. a m	Breadth h k	Noſe.	Upper Lip.	Chin.	Neck.	Ear.
Calmuck - -	4	$4\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{1}{2}$	1	$\frac{6}{8}$	$\frac{9}{10}$		$1\frac{1}{16}$
Negro - -	4	$4\frac{6}{8}$	$1\frac{7}{8}$	$2\frac{1}{4}$	$\frac{6}{8}$	$\frac{5}{8}$	$\frac{7}{8}$		1
European - -	4	$3\frac{6}{8}$	$1\frac{6}{8}$	$2\frac{3}{8}$	$1\frac{1}{8}$	$\frac{5}{8}$	1	$1\frac{1}{2}$	$1\frac{1}{8}$
Antique - - -	4	$3\frac{4}{8}$	2	2	1	$\frac{1}{3}$	$\frac{2}{3}$	$1\frac{3}{4}$	1
Child juſt born -	4	$4\frac{1}{6}$	$2\frac{1}{2}$	$2\frac{1}{4}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{1}{2}$		1
Child one year old -	4	$4\frac{6}{8}$	$2\frac{1}{8}$	$2\frac{1}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{5}{8}$		1
An aged perſon -	4	$4\frac{1}{2}$	$1\frac{7}{8}$	3	$1\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{8}$
Apollo - - -	4		2	$2\frac{1}{4}$	1	$\frac{1}{3}$	$\frac{2}{3}$	$1\frac{1}{2}$	
De Wit - -	4	$3\frac{1}{2}$	2	$2\frac{1}{4}$	1	$\frac{1}{3}$	$\frac{2}{3}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Alb. Durer - -								$1\frac{1}{2}$ to 2	
Vitruvius - -	4				1				

It appears from the above Table, that the antients obſerved a medium proportion. For example: From the tip of the noſe to the ear, in a Calmuck, is 2 and 4-8ths; in an European, 2 and 1-8th; in the Antique, 2 and 2-8ths. And the chin nine-tenths, eight-eighths, and two-thirds. The beauty of the face depends therefore upon the relative proportions which the parts have to each other; as 1 : 4, or 1 : 3, &c. Thus alſo, when the face is ſeen in profile, the breadth ough not to exceed the height, as in the Negro and Calmuck: in us they are nearly equal. The form which approaches to the quadrangular, gives a certain flatneſs to the countenance. The antients have removed this imperfection, by making the head higher, which proportionally diminiſhes the breadth.

When the faces are contemplated in front, as they are repreſented in the third plate, conſiderable differences will be obſervable. For example:

The greateſt breadth of a Negro's head is equal to three-fourths of its height, and the cheeks M N are as $2\frac{5}{8}$

In a Calmuck, the cheeks M N are = 3

In a European - - - $2\frac{6}{8}$

In the Antique - - - $2\frac{4}{8}$

The breadth of the Negroe's head P O is = 3

Calmuck's - - 3

European - - $3\frac{3}{8}$

Antique - - - $2\frac{1}{2}$

Hence it appears that the countenance of the Antique is not only more elevated, but that it is conſiderably leſs broad in proportion.

From the form of the eye-ſockets, it is obvious that the temples cannot be broader than the bony parts, together with the ſkin, &c.

Now X W.	in the Negro is as	$2\frac{5}{8}$
	in the Calmuck	$2\frac{1}{2}$
	European	$2\frac{1}{3}$
	Antique	2

To judge of the dimenſions of the eyes, X W. muſt be divided into three parts within the rim of the eye-ſockets. Thus there remains for X P ⋈ W O, only one-fourth of the whole breadth P O.

All thoſe who have written upon proportions, as Alb. Durer, De Wit, &c. allow the ſize of five eyes for the breadth of the face. In children, Durer has given ſix eyes. But I am convinced that the head in no inſtance can be ſo broad. The antients have never exceeded four; which correſponds the neareſtwith the breadth obſervable among us.

In children, the diſtance between the eyes (ſee Plate V. Fig. 1, 2. P O.) is equal to one-third from K K, or the temples. Although from the diſeaſe above mentioned, the head of the child, repreſented in the ſecond figure, is five eyes in breadth,

by comparing this with figure the fifth of the ſame plate, it will fully appear that the addition to its breadth is no addition to its beauty. Painters in general ſeem to be much embarraſſed concerning the breadth of the face, as appears from De Wit, Alb. Durer, and Le Brun, who never give leſs than the meaſure of five eyes. The celebrated Queſnoy has been much more careful and fortunate in giving not more than four eyes as the breadth of his heads. If I miſtake not, Teſta has obſerved the ſame proportion in his children.

The breadth of the noſe is always determined by the diſtance of the lateral proceſſes of the upper maxilla (ſee Plate III.) E F. in proportion to the diſtance between E and F, will be the width of the noſe. It is becauſe the triangle C Q R. forms ſo large an angle, that the diſproportion appears ſo conſiderable in the noſe of a negro. In us the noſe is generally broader than the diſtance between the eyes. The antients have obſerved the ſame proportion.

The mouth muſt completely cover the *dentes canini*, as has been already ſhewn. It muſt therefore be broader, as theſe are placed at a greater diſtance from each other. But ſuppoſe the diſtance to be in reality the ſame; that is, ſuppoſe Q R. (in figures the fourth and fifth) to be perfectly equal, yet the mouth will appear ſmaller when the two ſides of the triangle riſe high. Compare Y Z. in each figure. In antiques the mouth appears ſmaller than with us, from the greater depth of the chin. The antients have made the mouth but a little wider than the diſtance between Y Z.; and

the noſe to incline downwards. This poſition of the noſe makes the upper lip ſmall. Thus it curls, as it were, upwards, which gives it a more graceful form. The upper lip of the Calmuck and of the Negro is directly the reverſe.

The antients made the neck twice the length of the noſe; but in Apollo it is as 1½; this proceeds from the ſize of the noſe; which being longer, the neck has ſtill the uſual length.

In children, De Wit has not given more than one-third of a noſe for the neck; Queſnoy, ſomewhat more: about the ſize of one noſe. De Wit has alſo omitted to give an under or a double chin to his young children; which always takes place, and makes the chin about one-fourth of the noſe longer.

CHAPTER III.

TO FIND THE PROPORTIONS OF THE HEAD.

MOST of the painters and drawing-maſters, who treat of proportions in their publications, take Vitruvius among the antients, and Albert Durer among the moderns, as their guides; and to eſtabliſh their own principles, they repoſe upon the authority of ancient ſtatues, without paying any farther attention to the human body, or meaſuring any particular parts of it with care and accuracy.

The portrait-painters of the preſent day, generally deſcribe an oval upon their panel before the perſon to be painted ſits to be drawn; make a croſs in the oval, which they divide into the length of four noſes, and the breadth of five eyes; and they paint the face according to theſe diviſions to which it muſt be accommodated, let the proportions themſelves be ever ſo much at variance.

I mean not to inſinuate that eyes, noſe, and mouth, or the curls of a wig, are to be meaſured with preciſion, which I have ſeen done by a celebrated maſter, and with very ill ſucceſs; for it is impoſſible to adapt this menſuration to the panel, becauſe every part has a diſtinct ſurface, and cannot be brought upon a correſpondent ſurface on the panel. It is ſimply my opinion, that every good painter or designer ſhould commence upon the proper basis; that is, ſhould pay

attention to the varieties which exiſt in the ſkeleton, and particularly in the bones of the head, in national characters, and circumſtances of the like nature; and then let him ſketch his oval, or any other figure, not according to his own fancy, but according to his model.

Perhaps it would not be improper to make uſe of the ancient method of drawing, which Pliny has aſcribed to the daughter of Dibutades of Sicyonia, and which is now practiſed for amuſement by perſons of faſhion; that is, to trace the ſhade of any one intended to be painted, by means of a lamp, if the portrait is to be in profile, and then aſcertain the preciſe ſituation of the principal parts, as eyes, noſe, mouth, and chin.

But, in fact, the niceſt proportions muſt in general be obtained by an attention to multitudes, and by imitating the example of Zeuxis, who ſelected, from a great variety of perſons, ſome minuter graces, which enabled him to compoſe the proportions that were the moſt pleaſing.

As the ſkeleton and the cranium ſerved my purpoſe the beſt in drawing a head, it has been my practice firſt to ſketch the cranium with as much attention and accuracy as poſſible; upon which, I afterwards placed the ſofter parts. This method has been omitted in the preſent Work, as it would have rendered my principal object more obſcure and intricate, although it would have enabled me to render my figures much more graceful and pleaſing.

Some of the bony parts are always marked on the countenance; they are never covered ſo as to be totally effaced. Such as the rim round the cavities of the eyes, the jugal bones, or Q of Plate I. Fig. 3 and 4; and H in Plate V. Fig. 3, 4.—the elevation above the noſe, and the depreſſion immediately under it, the ridge of the noſe or the termination of the naſal-bone. See Plate IV. Fig. 1, 2, 3, 4.

The lower edge of the inferior maxilla, in the region of the chin, and at its foremoſt angles, manifeſt themſelves, and point out diviſions: the temples approach to the cavities of the eyes, which always limit the breadth of the face. The orifice of the ear alſo gives a determinate point, and indicates of itſelf the ſeat of the lobes, which are to be placed immediately under it; and of the ear itſelf, to be placed immediately above it.

In a word, the bones of the cranium are ſimply covered with ſkin and a dipoſe membrane; and theſe are no impediments to our taking the cranium as the trueſt baſis of the intended portrait.

It was in this manner that I obtained the profile of the modern face, in the firſt figure of the ſecond plate. This was very ſimilar to many other fine heads that have been diſſected by me, in my profeſſional character, and were afterwards ſawn through the middle perpendicularly, that I might be able to obtain a perfect profile. I have drawn ſeveral of theſe with a pen and thick ink, upon a plate of glaſs placed

over them, and the ſketch has afterwards been taken upon varniſhed paper. It was by thoſe means that I formed no ſmall collection; which was of conſiderable ſervice in the courſe of my Lectures, and of which I have made uſe in the preſent Work.

If due care be taken to let the line of viſion fall in a right line upon every ſpot, the above method is much more accurate than the uſe of a lamp or candle in drawing of profiles; for the rays of light proceeding from one point, diverge in an unequal manner. Yet it muſt be allowed that a death's head does not accurately reſemble the living; and alſo that by being ſawn through, it is leſs perfect than when intire.

Obſerving that the *linea facialis* inclined backwards (ſee Plate II. Fig. 1.) M G. making an angle of eighty degrees with N C. I have preſerved in the ſecond figure all the proportions of the under jaw, and placed M G. perpendicularly, forming the angle M N D. equal to ninety degrees; that is, a right angle *.

Every part which touches the facial line in the firſt figure, as T N G. touches it alſo in the ſecond. The cranium retains its depth; that is, T D. in the ſecond is equal to T D.

* Albinus makes the line 90 degrees. Alb. Durer has made it in a man 88, in a woman 96, and in a child 94. De Wit has made it in women 100 degrees (ſee Tab. XI. XII.) in Apollo 94 (ſee Tab. XII.) in a man 92, and in a child 96 (ſee Tab. X.)

in the firſt figure; but the ſpace C D. is diminiſhed in proportion as M E. is increaſed: C D. is now leſs than N C. although it was much larger in the firſt figures; and the height C E. is increaſed from E to Y.

I afterwards made M G. incline five degrees more forwards (as in Plate II. Fig. 3.) ſo that M N D. formed an angle of 95 degrees. C D. is ſtill more diminiſhed, and C E. becomes larger; that is, E Y. is equal to H M. the projection beyond the line H G.

The lower maxilla is ſmaller, and becomes more under the ear, yet h k, or the diſtance from the tip of the noſe to the ear, remains the length of two noſes; and the neck is more graceful. Finally: I let the line M G. fall to 100 degrees, by which the height E Y. equal to H M. was gained (ſee Plate IV. Fig. 4.); by theſe means the line that croſſes the eye at m 2, paſſes exactly over the centre, and gains a proportion correſpondent to that of the antique: that is, a form of head which is four noſes in length, every other part being in proportion. It is to be remarked, that the external rim of the eye-ſocket m, remains in the three laſt figures at an equal diſtance from the perpendicular line H G.

This projection conſtitutes the *maximum*. Place the facial line more forward, and E Y. becomes too elevated; the head is more than the proportion of four noſes; the upper lip too ſmall, and the face deformed.

If it be now aſked, What is meant by a fine countenance? we may anſwer, That in which the facial line M G. makes an angle of 100 degrees with the horizon. The ancient Greeks have conſequently choſen this angle; but whether they have gained the proportions of the different parts from the principles which I have advanced, I am not able to decide. It is certain that ſuch a form is never to be met with among moderns; and I doubt whether the ancient Greeks themſelves had living models of the form; for neither the Egyptians, from whom they were probably deſcended, nor the Perſians, nor even the Greeks, have ever given ſuch a form, when they ſimply aimed at delineating portraits *.

This antique beauty therefore is not in nature; but to uſe the term of Winckelman, it is an ideal beauty. Thus, when the Greeks formed medallions of the Roman emperors, although they were obliged to obſerve a reſemblance, yet they added ſomething of the ideal beauty. This characteriſtic will eaſily enable a connoiſſeur to diſtinguiſh a Grecian from a Roman medal. I have never found this characteriſtic ſo conſpicuous as in the *Muſeum Odeſcalcum*, where not only the countenances of ſeveral women, but even the larvæ, or faces of the maſks, manifeſt the line.

As there is a *maximum* on the one ſide, ſo is there a *minimum* on the other. As ſoon as we recede to 70 degrees,

* See the portrait of Auguſtus Cæſar, Pharnaces, and others. Plate IX. Fig. 4 and 5.

we give the countenance of a negro (as in the third figure of the firſt plate). Lower than 70 gives the features of an ape; ſtill lower, the reſemblance of a dog, &c.

The utmoſt extent that can be allowed for the face of an European, is ten degrees behind and ten degrees before the perpendicular line H I. All that exceed in either direction loſe their beauty, and even become miſhapen. But the negroes have alſo their *maximum* and *minimum* of comelineſs. Of theſe I cannot ſpeak with preciſion, as a competent number of heads are not in my poſſeſſion; nor have I enjoyed ſufficient opportunities of comparing them. However, the facial line muſt not ſink much lower than five degrees; that is, to 65; as the countenance would too cloſely reſemble that of an ape. Thus, if the facial line of the ape was too low, it would approach to that of the dog, &c.

I have obſerved, that in all quadrupeds, both genus and ſpecies may be diſtinguiſhed by the poſition of the bones of the upper jaw, immediately before, above, or obliquely under the ball of the cranium. I have drawn the heads of many different animals upon the ſame line; which exhibits an appearance that not only would be of inconceivable ſervice in natural hiſtory, but of infinite ſervice to the painter. But this ſubject is foreign to our preſent purpoſe; and to do it juſtice, would be to write a volume.

What has been remarked concerning adult perſons, is alſo applicable to children.

In the fourth plate I have faithfully copied after the originals before me. In both, the facial line was perpendicular, which has not been favourable to beauty, or to a pleaſing countenance. The fourth figure of the fifth plate exhibits a much finer face, although the eyes are not in the centre; the upper rim of the ſocket of the eye being about the central point, according to the rule obſerved by J. de Wit, in imitation of Queſnoy and Fiammingo; only the occiput is too long. Reſpecting this article, I have not been able to find out any determinate rule for infants. When the child arrives to the age of three or four years, the lower maxilla ſhoots downwards, and the occiput becomes leſs. It does not appear to me that we are under any obligation ſervilely to copy this unpleaſing ſhape in our figures of young children, particularly as in this country it proceeds from weakneſs; which renders the heads of children larger with us than in any country in Europe.

When the facial line falls more forwards (ſee S Z. of Plate V. Fig. 3 and 4.) the whole form becomes deſtitute of regular proportions; and the head aſſumes an hydrocephalous appearance. Therefore, the utmoſt extent with children, as well as with adults, is from 100 to 80 degrees.

Reſpecting the mouth, it is to be obſerved that children having neither teeth, nor projecting *alveolæ*, in either the upper or lower maxilla, the tongue cannot eaſily be confined within the mouth; ſo that they have generally the mouth open; that is, the lower jaw is kept at a diſtance from the

upper; and this gives ſomething of an oblique direction to the lower part of the face. (See D B. in the ſecond figure, and X E B. Fig. 4.) We may add, that the lower jaw is ſhorter than the upper; and as it does not make a large angle with the hindmoſt part (ſee K. in all the figures of Plate IV.) the mouth opens more eaſily and wider. But ſtill the orifice of the ear (ſee I. of Plate V. Fig. 3.) remains the central point, by a line from which to the point B. the inclination of the child is to be limited. Queſnoy has been very attentive to theſe peculiarities, and he has made the line D B. deſcribing the diſtance from the tip of the noſe to the tip of the chin very long. See Plate V. Fig. 4.

The under or double chin is more ſtrongly marked by this poſition; the neck is ſhorter, and the whole is more pleaſing. De Wit, on the contrary, has taken his proportions from under the noſe to under the chin, as being equal to one-fourth of the height. For this reaſon has he frequently given a cloſed mouth to his children; which renders them leſs pleaſing than the children of Queſnoy *.

In moſt perſons the ear is of equal length with the noſe; that is, one-fourth of the height of the head. It ſeldom ſtands higher than the middle line, and the lobe generally ſinks lower than the naſal line. Alb. Durer makes the noſe

* Preiſler's figures of childrens heads are taken from Alb. Durer, and have the ſame faults. In Table I. Part III. the chin comes too forward, and is too long; this, connected with the general ſmallneſs of the features, makes a mixture of infancy and manhood in the ſame face.

of an adult about this ſize. De Wit makes them larger, and ſeems careleſs about proportions. In his Twelfth Table, the lower part of the ear is on a line with the noſe, and the upper even with the rim of the eye-ſocket, and thus more than one-fourth. In Fig. 5 and 6, of the ſame Table, the lobes are not placed ſo low. In general, he has placed the ear too high, and even the orifice, which never varies, being always parallel with the line of the noſe. Alb. Durer, and all his followers, have done the ſame. The propriety of my remarks is demonſtrated by the accurate figures of oſteology, in the tables of Euſtachius, where the ear is repreſented parallel to the naſal line.

Attention muſt alſo be paid to the breadth of the ear. De Wit generally makes the breadth too ſmall. The antients have avoided repreſenting the ear naked, as much as it was poſſible; in which they are to be commended, as in itſelf it is not a pleaſing figure. The cavities, the rim, the lobes, and other parts, are too ſmall and inſignificant to ſuffer a compariſon with the countenance. It is therefore adviſeable to cover the ear itſelf, and to make the lobes alone viſible. However, in ſome caſes they muſt appear totally; as in the repreſentation of a bald head. In this caſe the breadth ſhould be equal to half of the height. It ſhould be drawn in an oval, the long central line of which ſhould be made to incline a little backwards. But if the facial line be made to project forwards to the 100th degree, then ſhould the central line be perpendicular; as, in this caſe, the upper part is already at a greater diſtance from the noſe than the lower.

In Negroes, Calmucks, &c. this line muſt be made to run parallel with the facial line.

Few painters have attended to the real ſtructure of the ear. Almoſt every treatiſe on the principles of drawing that I have ſeen, is defective in this article. The French appear to be the moſt attentive to it. In the *Dictionnaire Encyclopedique*, the writer of the article upon the principles of drawing, has given a very accurate repreſentation of the ear. In the book of drawing, by Bloemaart, there is not one figure of the ear that is natural: nor even in that by Preiſler, notwithſtanding he has taken more pains than any of his brethren to aſcertain its exact proportions *.

In children the ear is very broad and large, as well as the head. It is therefore beſt to conceal it, as has been already obſerved, ſince the ear cannot add to the beauty of countenance.

In the above diſquiſitions I have endeavoured to draw from Nature herſelf the conſtituent principles of beauty, in the form of the head. I am far from aſſerting, that a rigid conformity to the rules laid down will always enable us to

* Aug. Carrache diſoit que l'oreille etoit la partie du corps la plus difficile a deſſiner; il en modela une plus grande que nature, pour en faire connoitre la ſtructure. Il en fit des etudes infinies, et l'on conſtruiſit un grand modele en platre appelle L'Orecchione d'Agoſtino. Bibl. de Peinture, Tom. II. p. 484.

catch the beauties which nature is perpetually preſenting to our view.

Horace ſays,

Non ſatis eſt pulchra eſſe poemata, dulcia ſunt.

The pleaſing effect, ſhould always be our primary object; and in ſome caſes it is better to deviate a little from the ſtrict rules of proportion, in order to increaſe the beauty of a piece, than to render it leſs pleaſing by a ſervile conformity.

APPENDIX to the preceding Chapter.

IT was the original deſign of Profeſſor CAMPER to give an additional chapter concerning the diſtinguiſhing marks of the antique in ſtatues, medals, intaglios, &c. But it appears that the difficulty of free acceſs to a competent number of ſpecimens in theſe provinces, has prevented him from executing the deſign. The few coins and intaglios, repreſented in the tenth plate, though ſo trivial in themſelves, may ſerve to corroborate what has been remarked in the Author's Introduction to this Treatiſe; and alſo what has been advanced concerning the ſuperior beauty of an antique head; and the explication of the cauſe of this ſuperiority given in the preceding chapter.

FIG. I. Repreſents Bocchus, King of Mauritania, in his youth. This was a copper medal. On the reverſe was the figure of an Elephant.

FIG. II. Bocchus, more advanced in years. On the reverſe, the Elephant. This was of copper.

FIG. III. Alexander the Great. A ſilver coin, with the Greek inſcription ΑΛΕΞΑΝΔΡΟΥ. On the reverſe was a Caſtle; above it, the Thunderbolts of Jove.

FIG. IV. Pharnaces, King of Pontus, with the inſcription ΒΑΣΙΛ... ΦΑΡΝΑΚΟΥ. A ſilver coin. On the reverſe of which was Peace with the Cornucopia, a Dog, Half Moon, &c.

The above coins are in the cabinet of the Prince of Orange. The two figures of Bocchus are about twice as large as the coins, that the contour may be more conſpicuous.

FIG. V. Is the repreſentation of Cæſar Auguſtus, mentioned in the Introduction as well as in the preceding Chapter, as an example that the antients, in their portraits of diſtinguiſhed perſonages, paid attention to the direction of the facial line.

FIG. VI. The Meduſa of Soſicles.

FIG. VII. The Head of Alexander, engraved by Pyrgoteles. It is obvious that, both in this and in the third figure, attention hath been paid to the facial line; and they ſerve as inſtances of the ideal beauty; which, indeed, is alſo conſpicuous in their repreſentations of the Divinities.

FIG. VIII. Theſeus, with his Club; by Gnaeus.

The four laſt figures are taken from the Treatiſe of the Baron De Stoſch, publiſhed in the year 1724, at Amſterdam. Plates 23, 25, 45, 55.

The facial line is too obvious to require further enlargement.

PART THE FOURTH.

THE PROPER MANNER OF SKETCHING THE OUTLINES OF A HEAD.

CHAPTER I.

CONCERNING THE OVAL.

ALL writers, on the principles of drawing, propoſe the oval, as the beſt method of obtaining a ſure hand in ſketching heads in every poſition, and of every age. No one has ventured to deviate from the method, notwithſtanding every one muſt have been convinced, from experience, that this figure is frequently defective, and merely applicable in a few inſtances. This I ſhall endeavour to demonſtrate:

Plate VII. Fig. 1. Let the height A B. be divided into four equal parts, A H. H I. I F. F B. Of theſe take two-thirds, or A F. equal to K L. for the largeſt dimenſions, and deſcribe the circle A K F L. The ears are to be placed between the parallel lines K L. and M N.

Divide K L. into four equal parts, and take one-fourth for the breadth of the temples O P. extending the compaſſes from F to I. or to the half of A B. draw from the point F. in the central line A B. the circle B N I M. Complete the oval from K to M. and L to N. Thus is the point L obtained, and alſo the central line of the eyes K L. *

Finally. Divide A B. into four equal parts, of which one is deſtined for the noſe; and E F. into three, of which the uppermoſt gives the ſeat of the upper lip Q R.

This method correſponds with the proportions given in the ſecond chapter of the third part of this Treatiſe †. This oval is a good one, and ſeems well adapted to all thoſe caſes where ovals can be applied with advantage.

But when the features are to be delineated in profile, as in the ſecond figure of the ſame plate, the manner appears to me totally deſtitute of the leaſt advantage. Let I R. be the length of the head, and A B or U V. the height; form your oval as in the other figure. This oval limits nothing; neither the ſituation of the ear, nor the direction of the facial line X Y. nor the ſeat of the eye P. All theſe muſt be placed according

* C. Van de Pas has formed the oval in this manner. See page 21. The manner which Alb. Durer followed in his firſt book of Geometry, is more complex and leſs perfect. See the Latin edition. Paris, 1532. p. 20, 21.

† Page 89.

to fancy, or by gueſs. Beſides, the cranium itſelf is not of a circular form ‡.

Books on drawing recommend the oval alſo for a face that is placed ſideways, between the profile and a front direction, as in Fig. 3. Well, draw the oval as before, and deſcribe the central line A D E B. in the direction of the oval, then divide the oval into four parts, and the lower diviſion into three parts, and you will find the points of incidence in the four diviſions, viz. S, D, E, F. in the line A D B. This is the manner laid down by Preiſler *.

Moſt portrait-painters follow this rule, and they always place the mouth on the middle line A D B. which is too near to the ear. It would not be difficult to demonſtrate this, or to prove that all the figures formed according to theſe rules of Preiſler are defective. The ſame error is obſervable in the fourth of Bloemaart's tables, and in many other of his faces. And, if I recollect rightly, Goltzius has alſo committed it.

In order to be convinced how much this method is defective, draw the facial line D Q R. upon your oval, according to the third figure of the fourth plate, either inclining or erect, as may be required, then you will find the points of

‡ It appears from the Author's notes, that he had intended to treat this ſubject more amply.

* See Part I. Plate V.

incidence to be D, Q, S, R. Let theſe be conſidered as the middle points, and the countenance becomes natural.

A. Van Dyk has paid due attention to this, and alſo many of the Italian maſters.

It appears, therefore, from the above example, that in ſuch caſes the oval is a deceitful guide. Drawing-maſters ought not to ſketch theſe lines upon a ſlate, or any flat ſurface, but on a ball of wood or clay, properly modelled.

CHAPTER II.

OF THE USE OF THE TRIANGLE IN SKETCHING A PROFILE.

HOET, A. Carrache, and ſome others, teach us that to draw the face in profile, an equilateral triangle muſt firſt be formed (as A B C. Fig. 4. of Plate VII.); that the foremoſt line A C. muſt be divided in three equal parts for the face; that is, the forehead, noſe, and chin.

But the point B. is of no uſe, unleſs to place the ear within it. Then, indeed, would the ſpace between D and F. be equal to two noſes, meaſuring from the lobe to the line interſecting the noſtril. But the lower maxilla would be thrown backwards, as in C and F. which is a diſproportion never to be met with in Nature.

However, it is allowed that by this method the facial line A C. is admirably well preſerved. Thus far is the triangle preferable to the oval.

Some artiſts, and particularly Le Clerc, in his copy of Le Brun's figures of the paſſions*, have uſed the ſmall equilateral triangle D E C. When one ſide of the triangle lies on the facial line, the point E. will mark the orifice of the

* Tab. I. Fig. 3.

ear with accuracy; ſo that the diſtance from I. to E. or rather I H. ſhall be equal to two noſes. But he has not applied it in this manner, and therefore it neither marks the proper boundaries of the facial line, nor of the ear. Beſides, this triangle only gives half of the face, with the ear. For theſe reaſons I think it of no great uſe.

J. C. Viſcher, in his *Fundamentales regulæ artis pictoriæ et ſculpturæ*, uſes the larger triangle marked by our A B C. Parizet, in his Treatiſe, entitled *Nouveau Livre des Principes du deſſin*, has adopted the triangle of Le Clerc, and with no greater advantage.

The great uncertainty and imperfection of the common methods, made me deſirous of inventing ſome other, which ſhould promiſe to be more certain, and more generally applicable. This object had long employed my thoughts, and, I think, with ſucceſs.

CHAPTER III.

A NEW METHOD OF DELINEATING THE HEAD.

BEING perpetually converſant with the ſkulls and faces of the dead, and having attentively examined them after they were ſawn through, for anatomical uſes, in the manner already deſcribed; and having alſo diligently traced the growth of the maxilla, and of the noſe, in the heads of infants that were but a few weeks old; an idea ſuggeſted itſelf, that in drawing or painting of the head, the beſt method would be to imitate the proceſs of Nature; firſt to form the cranium or ſkull, then mark the facial line in the direction required, and afterwards arrange the other parts according to given proportions.

The ſkull is an horizontal oval, of which the hindmoſt parts are the largeſt, and the fore-part rounded like the ſection of a ball or globe. I firſt draw this oval by means of two circles, the one is S L V E W. which contains about three parts of the head; the other, K U Z. which is in ſize eight-ninths of the other circle. Draw the horizontal line S T. which extends from the centre of the large circle S. to T. the centre of the ſmaller; and is one-fourth of the larger circle. From the centre S. I let fall the perpendicular line S Q; this marks the ſeat of the orifice of the ear, and of its lobe at E.

2. I draw P G. the facial line, in the degree of inclination required: K. marks the place of the forehead; F. the line of the eye; I. the noſe; H. and a third of I B. or I G. the mouth.

3. I complete the oval Z V E. which marks with ſufficient accuracy the lower edge of the eye-ſocket.

4. I take G N. which may be equal to the ſize of the noſe, or leſs, according to the inclination of the facial line, and thus I mark the commencement of the neck.

This manner is perfectly ſimple, natural, and indicates all the principal parts in the proportions required. Not to obſerve that it is eaſier to ſtrike an horizontal oval than a perpendicular one.

To delineate a perſon advanced in years, I firſt draw the oval K L V E. and the facial line P K H G. See Plate VIII. Fig. 2.

2. As in every aged perſon the teeth are wanting, and the *alveolæ* are obliterated, by which the maxillæ have loſt about one-third of their ſize, I purſue the method recommended in deſcribing the ſecond figure of the ſixth plate, to aſcertain the preſent place of the chin, &c.

3. Conſidering G. to be the ſeat of the chin, in its more perfect ſtate, I place the compaſſes in E. and draw from G.

the curved line g G. and place the tip of the chin at g. which is about two-thirds from I B.

4. I next divide G I. into three equal parts, the upper of which is for the mouth.

5. I alſo draw the protuberance K F. as this generally projects conſiderably from the facial line, in very aged perſons.

6. Finally. I take the length of a noſe at G N. and ſketch the neck N O.

Thus I obtain an aged face, with all its characteriſtics, in the moſt perfect manner.

In children, the form of the cranium being ſimilar (ſee Plate VIII. Fig. 4.) the oval muſt be drawn as before, then the perpendicular line N Q. next the facial line P G. Since children have not the protuberance on the forehead, as has been remarked *, the F. (ſee Fig. 1 and 2.) muſt be placed within the perpendicular line; whereas in the firſt figure it touches, and in the ſecond it projects beyond it.

2. The eyes are two-fifths of the whole height, meaſuring from under the chin, and three-fifths from the top of the forehead. This agrees with the proportions of De Wit and Alb. Durer.

* See Part II. Chap. I. p. 50.

3. The diſtance from i. to e. the place for the noſe, is equal to one-fourth of the line L Q. but as the upper and lower jaw are, from cauſes aſſigned already, one-third narrower in young children, as well as in aged perſons, the line a b. muſt be drawn from A B. to L Q. and the oblique line c d. as was explained when we conſidered the fourth figure of the fifth plate. Thus is the point of incidence g. for the tip of the chin, and G. for the mouth. A a. is now divided into five parts alſo; three-fifths of which will indicate the line of the eye, and two-fifths are deſtined for the face.

In drawing the ſketch, firſt ſtrike the oval, then draw the facial line P G. let G g. be noted upon the line d c. and then draw a line from g. to h. the origin of the neck behind; and all the principal points will be accurately noted. When the mouth is to be repreſented more open, G. muſt be placed proportionably lower and more backwards.

A ſketch drawn in this manner gives the moſt natural repreſentation of a child's face.

To delineate the negro (ſee Fig. 3. of the eighth Plate) a ſimilar method muſt be obſerved. After the oval is formed, draw the facial line P G. inclining backwards, according to the rules laid down in the Third Chapter of Part the Firſt; then draw a line from B. to H. and you have the point of incidence at K. which limits the mouth. Thus you obtain the particular form of countenance. B N. being equal to one-fourth of A B. points where the neck commences.

The other parts, and their proportions, have already been too fully deſcribed, to render a more circumſtantial detail neceſſary.

Thus is the remark of Philoſtratus verified, that lines ſimply drawn with chalk, may characterize the Indian, by a flat noſe, ſtiff hair, prominent jaws, &c. *

This manner of ſketching is acquired with equal eaſe with the one in common uſe. It is alſo perfectly applicable to the repreſentation of the paſſions of the mind. In the expreſſion of aſtoniſhment, fear, &c. when the mouth is open, the chin muſt be placed lower and more backwards; the concomitants muſt be expreſſed by the action of the muſcles; and this action of the different muſcles in the excitements of paſſion, may alſo be explained in a phyſiological manner, with as much accuracy as, I flatter myſelf, has been obſerved in theſe delineations of different nations and ages.

The diverſity of countenances is made by varying the proportions, and changing the poſition of the facial line. Theſe give a large ſcope within the limits of reſemblance, and alſo of beauty.

The rules given by Alb. Durer, in his Treatiſe concerning the manner of changing ſtatues, and the features of the face,

* Life of Apol. of Thyan. Cap. X. See alſo Junius, on the Knowledge of the Antients in Painting. Lib. III. Cap. II. p. 259.

are moſtly productive of a caricature, which is ſeldom applicable to the art of drawing, although it is not totally deſtitute of utility.

It were to be wiſhed that artiſts would apply themſelves to the aſcertaining of the true figure of the human body upon the plan here propoſed: I am convinced that the progreſs would at leaſt be equal to theſe my labours reſpecting the head and countenance. May I entertain the hopes, That a ſtudy begun by myſelf, will be brought to perfection by ſome other admirer of the art?

BOOK II.

LECTURES

ON THE MANNER OF REPRESENTING THE DIFFERENT PASSIONS—

ON THE POINTS OF SIMILARITY BETWEEN THE HUMAN SPECIES, QUADRUPEDS, BIRDS, AND FISH;

WITH RULES FOR DRAWING, FOUNDED ON THIS SIMILARITY.

BOOK II.

LECTURE I.

THE MANNER OF DELINEATING THE DIFFERENT PASSIONS.

THE art of painting was, in times the moſt remote, not only valued as a pleaſing, but as a very important art. Ariſtotle informs us, that the Greeks made it an eſſential part of their education; and that it was univerſally expected of the children of richer citizens, that they ſhould be able to criticiſe the works of their renowned artiſts with judgment, and be qualified to furniſh their own manſions with taſte and elegance.

Their laudable example was once imitated with zeal and ſucceſs by the inhabitants of this country. In almoſt every town the citizens of diſtinction were educated in ſome knowledge of the arts. We muſt now lament the change that has taken place in moſt of the towns which were once the reſidence of celebrated artiſts. Your city alone ſhews itſelf to be the patron of this amiable ſiſter of poetry; and its foſtering care not only promiſes every advantage to riſing

youth, but inſpires a ſpirit of emulation in the boſom of artiſts themſelves, that has been productive of works which reflect an honour upon the country at large.

I will not expatiate upon the excellent leſſons and judicious diſſertations which have been delivered in this place by ſeveral members of our ſociety, as I ſhould offend the modeſty of thoſe who are preſent; but the great attention that has been paid to my feeble endeavours, upon former occaſions, manifeſts the zeal of its members, and their predilection for this delightful art. The approbation with which my attempts to ſhew the intimate connexion ſubſiſting between the ſcience of anatomy and painting were crowned, have encouraged me to purſue a ſtudy which has always been my amuſement, and the principles of which I have long deſired more deeply to inveſtigate.

In the year 1770, I had the ſatisfaction of demonſtrating before you, with what taſte, and with how much certainty, the different features in perſons of various ages and nations may be delineated. In the preſent Lecture I ſhall endeavour to explain to you, in what manner the different paſſions inſcribed upon the countenance may be expreſſed with the utmoſt accuracy. But as this ſcience is more refined, ſo are the principles of it more difficult. They require an accurate knowledge of our make, not merely reſpecting oſteology, or the arrangement of the bones, but alſo reſpecting the muſcles and nerves, in order to judge with preciſion concerning the rules I ſhall propoſe.

The ſkilful repreſentation of the paſſions of the mind, by painting or by ſtatuary, has been admired from the remoteſt times. Pliny informs us, that one Ariſtides of Thebes was the firſt who delineated with ſucceſs the various emotions of the ſoul. Although the arms, legs, and different poſitions of the body co-operate in the expreſſion of certain emotions, yet the face has always been conſidered as their principal ſeat. Cicero terms the countenance the mute interpreter of the heart; and Seneca, who had made great progreſs in the knowledge of the human mind, juſtly remarks, that violent emotions, of every kind, cannot eſcape manifeſting themſelves in the countenance. To theſe general obſervations the antients have alſo added, that the eyes are moſt expreſſive of theſe emotions. Pliny, that proficient in all the polite arts, ſays, "the mind dwells in the eye." He alſo knew, that the motions of the eyebrows contribute a conſiderable ſhare to the oſtentive effects.

I muſt refer you to the Treatiſe of Junius, on the knowledge of the antients in painting, if you wiſh to be informed concerning the extent of this knowledge. It is true, the principal performances of their renowned maſters are loſt; but from the Laocoon alone, we may collect how deeply they had inveſtigated the influence of pain. Not merely does the face, but the arms, legs, in ſhort all the muſcles of the body, indicate anguiſh.

The lovelineſs of the *Venus de Medicis*—the dignity of the Pythian Apollo—the deities, male and female, engraved

on precious ſtones—the different maſks—the ſportive fawns, manifeſt that expreſſion of countenance conſtituted no ſmall part of the excellency which is ſo much admired in the ſtatues, paintings, and engravings of the antients.

The fine arts were buried under the bad taſte that prevailed during the middle ages, until from the fourteenth century every branch of ſcience began to revive; and in the ſixteenth and ſeventeenth centuries they flouriſhed with ſuch vigour, that Europe ſeemed to require a pauſe to reſt from the fatigues of producing ſo many eminent characters.

But to return. Paullo Lomazzo, in his valuable work *Dell' Arte della Pittura*, publiſhed ſo early as in the year 1531, deſcribes the influence of the paſſions upon the muſcles of the face, and ſtill more minutely the different poſtures and contortions of the body. He relates, that Michelino, a Milaneſe artiſt, had painted two peaſants, and two country girls, who laughed ſo heartily, that no one could look at them without laughing. He tells us alſo, that to draw laughing features was the great amuſement of Da Vinci. But I need not inform you, that, at the period referred to, caricatures were ſo much the mode, that at length they became diſguſting. Leonardo alſo, who flouriſhed at the beginning of the ſixteenth century, very naturally deſcribes, in his immortal work on painting, all the various changes of countenance; but, like Lomazzo, he has chiefly ſtudied the different attitudes of the body. Both theſe great men ſeemed more attentive to general effect than to particular features.

To the liſt of great men who have diſtinguiſhed themſelves in this department, may be added the names of Michael Angelo and Raphael, who ſeem to have made the different expreſſions of countenance their principal ſtudy. I well remember the aſtoniſhment I felt, when I firſt contemplated the Penitence of Peter, painted in one of the cartoons; and who can remain inſenſible to the anguiſh of Proſerpine, when forced away by Pluto, as it is chiſeled out in ſtone by Buonaroti!

However, no one has arranged the expreſſions of the different paſſions upon the countenance more ſyſtematically than Le Brun, who flouriſhed about the middle of the ſeventeenth century. He has executed this work in ſo maſterly a manner, that every nation has followed his leſſons, and copied his examples. The great Buffon alone has ventured to deviate from him; but not with the greateſt ſucceſs. I ſhall leave every connoiſſeur to decide whether I be to blame in placing a much inferior value upon his drawings than upon thoſe of Le Brun.

All the authors I have mentioned, have either confined themſelves to appearances, or, like Le Brun, have reaſoned metaphyſically concerning the operations of the mind, without attending to the phyſical cauſes of the changes produced by theſe operations. But in my opinion, ſpeculations concerning the manner of the ſoul's working, or concerning the ſeat of the ſoul, are of no uſe to the artiſt. Theſe belong to metaphyſicians, who by the way loſe themſelves in a labyrinth of terms, or words with no definitive meaning, without

having in the leaſt explained the action of this immortal principle upon the corporeal and mortal frame.

Pliny, Da Vinci, and Junius, have particularized the principal appearances, but have mentioned little concerning the connexion that there is between the parts affected; and ſtill leſs have they particularized the changes which neceſſarily ariſe from the various affections of the nervous ſyſtem. Wattelet alſo has deſcribed the paſſions, and their influence, with much good ſenſe, and in a ſtrain of eloquence. It ſhall be my object not to ſpeculate concerning the workings of the ſoul, but to enquire what changes take place in the body, in conſequence of its operations. We ſhall inveſtigate the appearances produced, the uniformity of theſe appearances, and their influence upon the features of the face.

The firſt thing requiſite, is to acquire an accurate knowledge of the form of the ſkeleton, and particularly of the cranium; the ſecond, To be well acquainted with the principal muſcles of the face, and their action; thirdly, To trace the nerves in their diviſions and connexions with theſe muſcles.

A few examples will illuſtrate my plan, and indicate its importance, however novel it may appear.

An oppreſſed, ſorrowful, and melancholy perſon, lets his head ſink downwards, or he ſupports it with his hand; the equipoiſe is no longer maintained by the muſcles of the neck; that is, the nerves belonging to thoſe muſcles are rendered inert.

A lively contented laugher, on the other hand, raiſes his head, and his breaſt is agitated. In the exceſs of the emotion, he places both his hands to his ſides, as it were to ſupport his body. At length his legs begin to refuſe their office; and he would fall to the ground if the fit continued.

A perſon in the impetus of rage, beats with hands and feet, ſtamps till the ground ſhakes under him; and his face is convulſed in a thouſand forms.

Deep reverence makes the tongue to falter, an inward trembling impedes the motion of the body; the moſt lively and expreſſive eyes are abaſhed, and look downwards; the heart flutters; if ſhame accompany this emotion, as is frequently the caſe, the face, neck, and breaſt are immediately painted of a crimſon colour.

It would be endleſs to particularize every emotion in a ſimilar manner. The obſervation deducible from theſe effects is, that in every emotion of the mind particular nerves are affected; conſequently every painter ought to make himſelf acquainted with the conſtruction and connexion of the nerves productive of theſe changes; at leaſt every one who undertakes to write ſyſtematically upon the ſubject, ſhould acquire ſuch a portion of anatomical knowledge, as to be able to inſtruct his diſciples in the general rules that flow from it.

The paleneſs ariſing from fear, or a ſudden alarm, depends, equally with bluſhing, upon the action of the nerves. Theſe

changes of colour may be accurately expreſſed by the painter; and in this he has the advantage over the ſtatuary, engraver, &c. But orators and public actors have the ſuperior advantage of giving the greateſt force to the expreſſions of the features, by exciting the requiſite movements in the parts themſelves.

As diſſecting of human bodies has been my conſtant occupation, I have had frequent opportunities of examining which of the nerves, communicating with theſe more active parts, muſt have been particularly affected; conſequently, which of the muſcles muſt have been excited to action by thoſe nerves; and from the action of theſe muſcles depending upon their origins, inſertions, courſe, and connexions, we may eaſily learn what pleats in the face, what kind of action in the hands, &c. they muſt neceſſarily occaſion. It is theſe appearances alone that I propoſe to elucidate in the preſent Lecture.

It may be objected, that according to the above repreſentation, the antients muſt have been acquainted with the anatomy of the paſſions; or that they, together with Raphael, Callot, Le Brun, and others, have ſucceeded wonderfully without this knowledge:—that Hogarth himſelf, who excelled in repreſenting the paſſions, was ignorant of all that I have advanced to be ſo neceſſary:—that John Steen, who was frequently ſo inimitable in the delineation of the paſſions, never dreamed of ſtudying the muſcles ſtript of their integuments, or of acquiring an intimate knowledge of thoſe nerves which ſo many anatomiſts themſelves know but imperfectly.

Notwithſtanding theſe objections, I am well aſſured that my remarks will prove both important and acceptable to this audience. Tracing the operations of Nature is always an uſeful employment; you will alſo ſee and admire her wonderful addreſs; and finally, we ſhall point out a method by which not only youth, but painters themſelves may make a ſpeedy progreſs in this moſt enchanting branch of the art.

We ſhall confine ourſelves to the face.

I ſhall firſt enable you to recollect the conſtituent parts of the cranium, its form, cavities, connexions, proportions, &c.*

Secondly, I ſhall delineate the principal muſcles of the face, and mark the true ſituation of the eyes, that you may be convinced that Le Brun has placed them too much inclining downwards; and that, in his repreſentation of Laughter, he has given an improper bend downwards to the inward angles of the eyes: he has committed a ſimilar fault in Weeping.

Thirdly, I ſhall demonſtrate that the pleats or wrinkles of the face muſt neceſſarily run in a rectangular direction, according to the courſe of the muſcular fibrillæ.

Fourthly, I ſhall exhibit before you ſome of the nerves, in order that you may underſtand the immediate connexion

* Several of theſe ſketches were *extemporaneous*, and have not been preſerved.

which takes place in the action of ſome of the muſcles in the ſame paſſion.

The ſixth pair, as they were denominated by ancient anatomiſts, or the eighth of the moderns, has long been termed the Pathetic. This pair communicates with the throat, breaſt, abdomen, and, by the intercoſtal muſcles, with the nerves of the arms and legs.

The fourth pair, or the leſſer pathetics, produce wonderful effects in ſurpriſe, in love, in dying.

It is by the action of the ſeventh pair, that we laugh, bluſh, or look pale.

Finally. I ſhall delineate the muſcles of the eyes, that a juſt idea may be formed of their motion in the full vigour of life, and in the article of death; and ſubjoin ſome obſervations concerning the ſynchronous and alternate motion of the oblique muſcles in friendly greetings, and in tokens of reſpect.

In Dying, the eyes are drawn towards each other; becauſe the power of the will ceaſes, and the muſcles act in conſequence of the remains of life ſeated in them.

Such are the principles we ſhall lay down; the right ſtudy and application of which, will enable the artiſt to ex-

preſs the paſſions of the ſoul with the utmoſt accuracy, and in their full energy.

EXAMPLES.*

I SHALL firſt ſketch a Death's Head. See Plate I. Fig. 1. Secondly, The principal Muſcles of the Face. Fig. 2. Thirdly, A countenance perfectly PLACID. Fig. 3. Fourthly, Expreſſing SURPRISE. Fig. 4. Fifthly, CONTEMPT. Fig. 5. Sixthly, COMPLACENCY, FRIENDLINESS, TACIT JOY. Plate II. Fig. 6. Seventhly, LAUGHTER. Fig. 7. Eightly, SORROW. Fig. 8. Ninthly, WEEPING. Fig. 9. Tenthly, VEXATION and WRATH. Fig. 10. Finally, The DYING. Fig. 11.

The quick tranſitions from one paſſion to another, which I am about to exhibit, may not, perhaps, excite leſs ſurpriſe than that which the great Ferdinand of Tuſcany experienced, when he ſaw Peter of Cortona working with his pencil at Florence. The painter perceiving that the Duke was particularly ſtruck with the figure of a child crying, convinced him that a very few touches of the pencil would exhibit laughter. He then reſtored the former ſtrokes, and the child was made to cry again; to the no ſmall aſtoniſhment of the Prince. I hope that you will experience ſomething of a

* The Profeſſor in demonſtrating theſe changes, made the requiſite alterations on the ſame face; and alſo pointed out the defects of other painters in a ſimilar manner. This had a powerful effect upon the audience, which cannot be produced to an equal degree by diſtinct figures.

ſimilar emotion, although it is not a Peter of Cortona that handles the pencil, but ſimply a lover of the arts.

Contemplate firſt the PLACID countenance. Fig. 3. Every feature is at reſt; no one muſcle is brought into particular action; all are in a ſtate of repoſe, without appearing relaxed or inert. There is a tranquillity in the eye void of languor, and the lips are in unconſtrained contact.

Let us ſuppoſe ſomething to preſent itſelf which excites a degree of SURPRISE or WONDER. Fig. 4. The intercoſtal nerves are immediately affected, and act upon the third pair; hence the eye-lid is opened, and the eye ſtands motionleſs in the ſocket. The ſame nerve acts upon the eighth pair at the ſame time; reſpiration is ſuſpended, the free motion of the heart is impeded, and the mouth is opened, as the maxillary muſcles deſtined to this purpoſe are affected; but as theſe act alone upon the lower maxilla, the teeth are not diſcovered. The hands are extended, and more particularly the fingers, from the action of their muſcular plexus.

The effects of CONTEMPT are very different. Fig. 5. The fifth pair of nerves are put in motion. Thus are the eyebrows drawn inwards and downwards; the mouth is firmly cloſed; but as the lower lip riſes in the middle, it becomes arched. The eyes are drawn ſideways, the muſculus abducens and adducens acting together by the force of habit.—By making the head to turn towards the right, and the

eyes toward the left hand, the paſſion is rendered more expreſſive.

Fig. 6. In COMPLACENCY, FRIENDLY GREETINGS, and TACIT JOY, thoſe parts alone act which have an immediate communication with the ſeventh pair of nerves. The angles of the mouth muſt never be drawn up alone, without other tokens of an incipient ſmile. Great care ſhould be taken to avoid drawing the eyebrows inwards: an error frequently committed by the French in their portraits.

LAUGHTER. Fig. 7. In laughter all the effects produced by the former affection are greatly increaſed, and others are ſuperadded. The whole countenance inclines forwards, but without the attention being fixed upon any determinate object. The outward edges of the orbicular muſcles of the eye are contracted, producing wrinkles and folds around the eyes. The lips are opened by the action of the orbicular muſcle, on the external ſides; hence the teeth, particularly the upper, are made to appear; ſmall wrinkles ariſe at the corners of the mouth, and the cheeks become fuller, &c.

If you would add an arch, or a wanton look, place the eye ſideways, and contract the upper eyelid expreſſive of a wink.

In a SORROWFUL countenance (Fig. 8.) the fifth pair of nerves are principally affected; the mouth is drawn downwards by the deſcent of the upper lip. To add DESPAIR to

this emotion, the face muſt be made to look upwards, and ſomewhat obliquely; the brow muſt be furrowed with wrinkles; and the middle of the eyebrows be drawn upwards.

In WEEPING (Fig. 9) all the muſcles which receive the fifth pair of nerves, act in a very forcible manner. Hence the corners of the mouth are drawn downwards, the lower part of the noſe upwards, the eyebrows deſcend, the eyes are nearly cloſed, and tears are preſſed out of the lacrymal glands.

If ANGER (Fig. 10.) accompanies the emotion, the action of the muſcles draws the eyes wide open; the eyebrows deſcend ſtill lower, and the teeth are violently compreſſed together.

DYING. Fig. 2. In dying it is to be obſerved, Firſt, That all the muſcles of the neck open the mouth, and elongate the chin. Secondly, That the pathetic nerves draw the eyes towards each other. And thirdly, That all the other muſcles ceaſe to act.

What Le Brun terms Veneration, is not well expreſſed*, as the eyes are repreſented drawn upwards by the action of the two oblique muſcles alone; whereas the upper and under *muſculi obliqui* muſt act.

* Plate III. p. 18. Plate IV. Fig. 5.

Accept, Gentlemen, theſe ſhort ſpecimens, by way of elucidating my principles. To repreſent every paſſion and poſſible emotion of the mind, would require more time than could be allowed by one who profeſſes to be an anatomiſt, and not a painter. My ſole object has been to awaken attention, and excite a ſpirit of enquiry; that you may be induced to conſult Nature herſelf, without indulging implicit confidence in the rules and examples given by the moſt celebrated maſters, which are frequently imperfect. If in theſe ſpecimens I have not anſwered your expectations; if my expreſſions have not been ſufficiently explicit; and my hand has failed in giving the requiſite ſtrokes of the pencil, I can ſtill perceive, by the ſatisfaction painted upon your countenances, that my endeavours to pleaſe you have proved ſucceſsful.

LECTURE II.

CONCERNING THE POINTS OF SIMILARITY BETWEEN QUADRUPEDS, BIRDS, AND FISH.

THE object of the preſent and following Lectures, ſhall be to ſhew the great ſimilarity there is between Quadrupeds, and the reſemblance of theſe to Birds and Fiſh; and alſo to indicate a very eaſy method of delineating all theſe animals in the moſt exact manner.

Should my audience deem the undertaking of little moment, or conſider the preciſe form of animals as beneath the attention even of painters themſelves, I could juſtify the deſign by quoting the laudable example of the antients. The Greeks, the Romans, and before theſe the Egyptians, were obliged to pay the moſt minute attention to every ſpecies of animals, not merely as emblems of their different idols, but as inſeparable from their ſacrifices, races, triumphs, &c. but theſe could neither be painted nor repreſented in ſtone or metal, without the knowledge of what conſtitutes the beauty and perfection of the animal creation.

The high value in which this art was held by the antients, will moreover appear from the Dog caſt in metal, which Pliny* informs us, was preſerved in the Capitolium, as an

* Lib. XXXIV. C. XVII. p. 646. Vol. II.

exquiſite piece of workmanſhip, with ſo much care, that the ſuperintendents were threatened with death in caſe of negligence.

We read alſo that Myron * had formed ſo beautiful a Cow in metal, that it was not only celebrated by the poets, but copied by the moſt ſkilful engravers with equal zeal, as a Venus, or any other fine workmanſhip, of the greateſt maſters. Count Caylus † has this cow engraved on a Cornelian; which is no inconſiderable addition to the cabinet of that celebrated connoiſſeur. Canachis acquired no leſs honour by a Hart, which he had formed in copper, that appeared ſo light and ſwift, that a thread might apparently be made to paſs under the feet. Tiſicrates is immortalized by his Lion; Simon, by a Dog; Nicias, by his paintings of ſeveral ſpecies of animals; and Androcydes, by his ſkilful repreſentation of Fiſh.

Whoever conſults the *Monumenti Antichi Inediti* of Winkelman, and particularly the Introduction ‡, will be made acquainted with the high value which, in the preſent day, is placed upon the Lion in the Capitol; the Sphinx in the palace of Borgheſe; and alſo the other animals by the fountain *Dell' Aqua Felice.*

The Horſe has excited ſtill greater ambition. I ſhall not mention the ſtory of Apelles, nor of his follower Lyſippus.

* Lib. XXXIV. C. XIX. p. 650. § 3.
† Caylus, Vol. I. Tab. I. Fig. 3. p. 135.
‡ P. 18.

Their ſucceſſor Calamis obtained ſuch renown for his horſes, that he is not only celebrated by Pliny * and Cicero, but Ovid has immortalized him in his verſes. Pliny ſays, that he was unrivalled in his repreſentation of Cars drawn by two or four horſes, notwithſtanding that Lyſippus, and his diſciple Euthycrates, had diſtinguiſhed themſelves in this department.

The valuable cabinet of Stoſch † manifeſts how great a maſter Aſpaſius was in the engraving of Horſes. Hylus has alſo excelled in Steers, and Lucius in Horſes.

Many triumphant cars, with four horſes abreaſt, are repreſented in *baſs-relief*, and engraved on precious ſtones, in a manner that exceed all imagination. They are moſtly repreſented with two, and with four horſes. I have never ſeen them with ten; though Nero introduced hunting with this number. In the cabinet of Count Caylus, there is an engraving, on Cornelian, of a conqueror with twenty horſes by the ſide of each other, which can be minutely diſtinguiſhed, and of exquiſite beauty.

It would be endleſs to enumerate all thoſe who have acquired celebrity by depicting of animals. Let me recommend to you the Catalogue of Ancient Artiſts, arranged with ſo much judgment, by Franc. Junius. This will inform you of the number of artiſts, who have acquired immortal fame by their repreſentations of various animals.

* Tom. II. p. 654. § 11. † l. m. n. Tab. xiii.—40, 15, 16, 31.

We will now direct our attention to those great masters that were your immediate predecessors, whose admirable performances must have made an indelible impression upon your minds. Who, of the present assembly, does not pant after the immortal fame, so justly acquired by a Van Berchem, a Potter, a Wouwerman, a Wenix, an Adrian Van de Velde, a Houdekoeter, and other great men which this country has produced? So superior and so manifold are the excellencies of these masters, that it would require too much of our time to particularize them; yet I do not recollect that any one, except the indefatigable Crispin Van de Pas, has professedly written on the proportions of animals; or has given, to the ambitious student, any rules to forward his success.

What Da Vinci has advanced upon the subject of horses, is not adapted to give general ideas. All that is communicated by P. Lomazzo, is merely a poetic description of the beauty of some animals. Charles Vander Mander amuses himself with trifles; and Laireſſe passes over the subject in total silence.

My undertaking must consequently appear to you the more bold and hazardous. But although the imperfections of the attempt cannot escape the observation of this intelligent audience, yet I am persuaded they will find an apology in its difficulties. You will readily perceive that the idea could alone suggest itself, by my attention to the close connexion there is between the tedious and indelicate employment of dissecting animals, and the most elegant of the arts! To

the accidental union of theſe two uſeful purſuits in the ſame perſon, may be aſcribed all that may be deemed uſeful in the following remarks. I will add, that a very large collection of the ſkeletons of different animals, in my cabinet, has given me frequent opportunities of comparing together their ſpecific forms. I ſhall deem myſelf abundantly recompenſed, if my labours ſhould awaken and direct Genius to bring this part of the ſcience to the perfection of which it is capable.

I propoſe to give two Lectures upon the ſubject. In the firſt, I ſhall point out the ſimilarities that exiſt between quadrupeds of every kind; between theſe and fowls; and alſo fiſh; and, finally, indicate thoſe peculiarities to which the painter, or ſtatuary, ſhould direct his principal attention.

In the ſecond Lecture, I ſhall point out the reſemblance between quadrupeds, fowls, and fiſh; and propoſe an infallible method of ſketching all theſe animals; and ſhall conclude with demonſtrating, that, like another Proteus, we may with a few ſtrokes of the pencil, change a cow into a horſe, a ſtork, or into any kind of fiſh we pleaſe.

I will not waſte your time by attempting to delineate animals in the moſt perfect manner with the pencil of Zeuxis, but rather, like Agatharchus, haſtily draw the outlines, and leave it to your taſte and judgment to ſupply the minutiæ which add elegance to a figure. I ſhall be amply ſatisfied if you ſhould be able to diſcover, amidſt theſe imperfect eſſays,

principles that may ſerve as the foundation of more perfect attempts.

No one who holds the art of painting in due eſtimation, can doubt that it is the grand object of the artiſt to delineate his figures after the life, and with the utmoſt accuracy; or to repreſent, by the cloſeſt imitation, the different objects which all-bounteous Nature has beſtowed upon us in ſo rich an abundance; yet it is highly advantageous, and, to excel, abſolutely neceſſary for the painter to acquire an intimate knowledge of all thoſe created beings he wiſhes to repreſent; and to penetrate, as it were, into the plans and deſigns of the great Creator, in the formation of the aſtoniſhing variety which ſtrikes us in the animal creation, and which excites within us the pleaſing emotions of wonder and admiration!

I ſhall begin with Man, whom we will conſider as the moſt perfect quadruped, and gradually deſcend to apes, dogs, the yerboa, &c. thence proceed to fowls, and then paſs over to the finny tribe.

Perhaps you will conſider the undertaking as extravagant, and the expreſſion unguarded; but I hope ſoon to convince you, that fiſh and fowls, as well as horſes and cows, may juſtly be deemed quadrupeds, although they are differently formed, that each may be able to exert the requiſite movements in the moſt eaſy manner, according to its particular ſtation. Each animal differs alſo in the form of its head, body, feet, tail, &c. according to the deſign for which it was created; yet, extra-

vagant as the poſition may appear, I ſhall prove that the oyſter, bound to a particular ſpot, contains the firſt principle of the fiſhy tribe, theſe of fowls, theſe of the dog, and every other quadruped, up to man himſelf!

I would willingly give you ocular demonſtration of the fact, by placing before you a ſketch of each; but this would be impracticable, within the limits of the hour. I ſhall confine myſelf, in the preſent Lecture, to the cloſe reſemblance that ſubſiſts between the different parts of theſe animals. I ſhall therefore delineate before you, the ſkeleton of a man, of a dog, an eagle, and a penguin, that you may be convinced of the likeneſs that ſubſiſts between them. The fiſh we ſhall reſerve for the next Lecture *.

You perceive by this general compariſon, that man is the moſt perfect of all animals; not becauſe he walks with an erect countenance, as Plato, and after him Cicero and Ovid, have remarked; as if it was a peculiar privilege in a man to look towards the heavens; for, as Galen has juſtly obſerved, ſeveral ſpecies of fiſh enjoy this privilege in a more perfect manner. The grand corporeal advantage enjoyed by man is, that he can walk, and even ſit, in an erect attitude. I

* The publication is neceſſarily imperfect concerning this very intereſting article, as the Profeſſor's principles cannot be illuſtrated by the diverſity of examples he delineated before the audience; in which he demonſtrated the grand points of reſemblance, and traced progreſſively the kinds and degrees of deviations from them.

may alſo add, that man alone is able to repoſe upon his back; and that, by the centre of motion being placed in the middle of his body, he is enabled to turn himſelf, to bend his body in a great diverſity of manners, and to walk with peculiar facility. All theſe advantages neceſſarily flow from the peculiar mechaniſm of his form. He has alſo many other advantages, which it would be foreign from our purpoſe to enumerate. To return to the brute creation.

1. Every one that contemplates a fine horſe, is ſtruck with the beauty of his neck. When we view a camel, the length of his neck and the ſmallneſs of his head ſtrike us the moſt. In the elephant, its long trunk, or proboſcis, is the principal object of admiration. In the cow, the thickneſs of its body is moſt remarkable. In the greyhound, on the contrary, it is the thinneſs of body and ſlenderneſs of the feet that attract our chief attention. In the mean time it is extremely obvious, that theſe forms of particular parts are a neceſſary conſequence of the ends to which theſe different animals are deſtined. Cicero has given us a beautiful deſcription of theſe ſingular differences, which manifeſts his deep penetration into the deſigns of Nature. "Some animals," ſays he, "are low of ſtature, that they may the more eaſily reach from the earth the food it affords for their nutrition. But thoſe animals which, for wiſe reaſons, are taller (as cranes, and alſo the camel) are aſſiſted by the length of their necks. Elephants are furniſhed with a ſpecies of hand, by which thoſe animals gather their food from the ground; as the immenſe

bulk of their bodies renders it impracticable for them to bend or ſtoop." *

This idea is exemplified in the ſhark; which, although it has long teeth, is deſtitute of a ſnout, which would be uſeleſs, as that animal ſeeks and devours its food while ſwimming in the water. Many are the inſtances of the neceſſity of a ſnout in ſome animals, and its uſeleſſneſs in others; and Nature has wiſely made their forms correſpondent. Galen has moreover juſtly remarked, that in thoſe animals which gather their food from the earth, the neck is the length of the feet †.

However worthy theſe obſervations of Cicero and Galen may be of their authors, and applicable to our preſent purpoſe, I confeſs that I had not an adequate conception of their importance, until my remarks concerning animals were brought to ſome degree of perfection, and thoſe further diſcoveries were made which ſhall be hereafter explained.

That diſtinguiſhed naturaliſt Ray, has, in his Preface to Willoughby's Treatiſe on Fiſh, expreſſed the thought of Cicero in other terms. He has further obſerved, that fiſh are deſtitute of necks; not merely becauſe they have not feet, but becauſe they can procure their food in every part of the watery element without them. Ariſtotle has likewiſe remarked that fiſh are deſtitute of necks. Snakes are alſo without them; and in this reſpect is their form very ſimilar to that of fiſh.

* Cic. de Nat. Deor. Cap. XLVII. p. 248.
† De Uſu Part. Lib. VIII. Cap. I.

2. Reſpecting the feet, it is to be obſerved that the wiſe Creator has uniformly made the fore feet of thoſe animals, whoſe ſtature renders a long neck neceſſary, lower than the hind feet, as in the ſheep, the deer, and camel; and in ſuch animals the *dorſal vertebræ* gradually deſcend from the hips. The giraffe is an exception, being deſtined to other purpoſes.

3. If we attend to the belly, we ſhall perceive that it is much larger in thoſe animals that feed upon graſs, than in the carnivorous claſs; and in thoſe which chew the cud, than in thoſe which do not. The reaſon is evident; the organs of digeſtion, or, in other words, the inteſtines deſtined to convert animal ſubſtance into animal ſubſtance, need not be ſo ample and voluminous as thoſe whoſe office it is to tranſmute graſs into animal ſubſtance. In this kind of vegetable, nutritious particles are diffuſed over a large ſurface, while it is compriſed in a much ſmaller ſpace in animal food.

The cow eats a large quantity at once, and afterwards ruminates. The horſe eats continually. The cow muſt conſequently have a much larger belly than the horſe, and this a larger one than the dog, &c.

4. The comparative length of animals is alſo proportionate to the number of the vertebræ of the loins. Some, as the elephant, have only three; the horſe, has five; the cow, ſix; the lion, cat, and camel, have ſeven.

5. In animals that live upon gramina; as elephants, horſes, oxen, deer, camels, and in all that chew the cud, alſo in ſwine, the feet are horned, whether they be whole as in the horſe, or cloven as in the cow and ſheep; becauſe the animals muſt ſtand continually to procure their food. All the others are divided into two, three, four, or five fingers, as in man. More than five fingers are never found in any quadruped.

6. In fowls, the wings terminate in fingers. All have a thumb to each wing; in the majority two fingers are ſuperadded. Many are furniſhed with nails; as the oſtrich and the ſpurred water-hen.

The above remarks are ſufficient to evince this truth: The more perfectly an artiſt is acquainted with the nature of animals, and the deſigns of their particular formation, the better he will ſucceed in his attempts to delineate them.

But as verbal deſcriptions may not be ſufficiently obvious, we will call in the aid of ſketches; the explanation of which will clearly indicate the truth and importance of my obſervations.

EXAMPLES.

EXAMPLE I.

THE HORSE. See PLATE III. FIG. 1.

1. Let B C D E F. limit the body and feet of the horſe. For the animal to move itſelf properly, the feet muſt be as G E. and H D. in length.

2. Trace the courſe of the ſpine with its cavity. Let A Y. be the foremoſt rib; and A. the moveable point of the firſt vertebræ of the neck. All quadrupeds have ſeven of theſe vertebræ.

INFERENCES.

1. The neck and head of the animal muſt be ſo long, that he ſhall be able to reach his food; that is, as A Y + Y Z.

2. When the head is ſmall in proportion to the height of the animal, the neck muſt neceſſarily be longer; as takes place in camels, ſheep, &c.

3. When the head is erect, the neck muſt neceſſarily be curved; either externally as B ⊙ r, or inwardly, as in aged horſes; and the neck is more or leſs in the direction of B ≡ r, in proportion as it ſinks.

4. In order to ſupport ſo long a neck, the proceſſes of the vertebræ neareſt to the prominence of the neck, or withers, muſt be very long, as in the horſe. See A B.

They are of conſequence ſhorter in the animals whoſe necks are differently formed; and the ſhorteſt in the human ſpecies, as man carries his head erect.

It is to be remarked, that the horſe is furniſhed with a large muſcle which runs over S C. to R. and unites with the *Soleus* at ∩, which empowers him to kick backwards with ſo much force, and which is peculiar to this animal. The cow being deſtitute of it, this part of the body is conſequently hollow.

By the way, the head of Bourgelat's horſe in the Hippiatrique is too ſmall; the length from E to S, or from the extremity of the ſhoulder to the extremity of the buttocks, being two heads and two-thirds, whereas it muſt be two and one-half, as in the painting of Stubbs, and other good maſters. In the Engliſh model of a horſe ſtript of its integuments, the head is only one-third of the length from F. to S. that is, conſiderably ſhorter. Unleſs theſe animals were furniſhed with extraordinary long necks, they would not be able to graze.

The height B E. from the withers to the hoofs, is generally equal to F S. and moſtly five feet. I have found the majority of heads to be two feet in length, even in foals; but the necks of theſe are proportionably longer.

EXAMPLE II.

THE COW. Plate III. Fig. 2.

First, Draw the outlines of a horſe as before. Secondly, Shorten the feet from E to e. and from D to d.

INFERENCE.

In conſequence of this conſiderable difference in the length of the feet, the neck of the cow need not be longer than from A to Γ. and when ſtretched in ſtooping to graze, as from A to Y. Hence the neck cannot be arched, as in the horſe, nor is it neceſſary, but it gently inclines upwards. The weight of the head always ſinks it, and alſo the horns, lower than the prominence B. This is always the caſe in that ſpecies of cattle that is moſtly known in Holland. It is for this reaſon that the withers, or prominence B. is not ſo elevated as in the horſe. Other peculiarities will manifeſt themſelves.

EXAMPLE III.

THE DOG. Plate IV. Fig. 3.

1. Draw, as before, the outlines of the horſe, and the line of the vertebræ.

2. Contract the belly from G H. to G Z. this difference being occaſioned by the nature of the food, as has been explained.

The neck of this animal is of various lengths, as it frequently eats and gnaws its food lying, as well as in a ſtanding poſture.

4. The feet muſt be made ſlender, in proportion to the ſwiftneſs of the animal.

5. As the thigh bone from H to ♌, is longer than in a horſe, the leg ♌ ♑ becomes proportionably ſhorter.

6. The tail muſt be made to ſpring upwards.

EXAMPLE IV.

THE CAMEL. PLATE IV. FIG. 4.

1. Sketch as before; but the feet muſt be made longer, and the belly thicker. In conſequence of this difference,

2. The neck muſt neceſſarily be longer than that of the horſe; and the head, though it be of equal ſize with that of the horſe, will appear ſmaller, from the ſame cauſe.

3. When the head is erect, the neck muſt be made to curve from beneath upwards, contrary to that of the horſe; and in ſuch a direction, that the poſition of the head may correſpond with the centre of gravity.

4. In this animal, as well as in the ſheep and deer, the line A F. muſt have only a ſmall degree of inclination upwards.

EXAMPLE V.

THE ELEPHANT. Plate V. Fig. 5.

1. Draw the horſe as before.

2. Were the neck of this animal to be as in the horſe, from A to Γ, that is, long enough for the mouth to reach the ground, high and prominent withers would become requiſite, proportionate to the weight to be ſupported. But this form could not take place according to the general conſtruction of the animal. Therefore muſt the neck be ſhortened, as from A to r. But the animal not being able to reach the ground, a trunk, or proboſcis, becomes neceſſary.

3. The vertebræ of the breaſt and back muſt now be made to form an arch.

4. The elephant has only three vertebræ of the loins, and becomes proportionably ſhorter.

Other peculiarities ſhall be left to your own obſervation.

LECTURE III.

THE SUBJECT CONTINUED.

IT has been obſerved in the preceding Lecture, that no one, excepting Criſpin Van de Pas, has given us particular rules for delineating every ſpecies of animal, with any degree of preciſion. I will now add, that the ſkeletons which lay the foundation of the whole ſuperſtructure, and direct the form both of men and animals have generally been repreſented in ſo imperfect a manner, that they are of no uſe to the painter.

All the ſkeletons repreſented by Coiters, are extremely bad; thoſe of Meyer are ſtill worſe. Nor is there a ſingle one in the coſtly, and in other reſpects, excellent work of Buffon, that can be of the leaſt ſervice to the artiſt. In all of theſe, as in the productions of Coiters, the *dorſal vertebræ*, or back-bones, are in a right line: the ſhoulder-bones, with the bones of the fore arm, the bones of the thigh, with the ſhanks, are alſo in a right line. Thus are the feet, in proportion to the length of the neck, ſo long, that not one of theſe animals would be able to reach its food from the ground.

Cheſelden, in his valuable Treatiſe on the Bones, has given us a very large collection of the ſkeletons of different animals;

which are beautifully executed. Theſe have been engraved by Vander Gucht and Schynvoet in a maſterly manner; but after imperfect models. Thoſe of the lizard, the turtle, the crocodile, and the eagle, are beautiful; thoſe of the bear, rabbit, and ſwan, are inimitable. The ſkeleton of the oſtrich may ſerve; but that of the hog is entirely uſeleſs. Upon the whole, the ſkeletons of animals left us by Cheſelden, are the moſt beautiful and accurate of any.

You will naturally ſuppoſe that the ſkeleton of the horſe, which is the moſt beautiful and moſt uſeful of animals, muſt have been delineated with peculiar care and exactneſs. But alas! excluſive of thoſe painted by the great maſter in this department, Stubbs, and engraved after his paintings, I know not of any that deſerve commendation.

The repreſentations of Carlo Ruini, who led the way, are uſeful to convey a general idea of the anatomy of the parts; but they cannot ſerve the painter. What then is to be expected from the works of Sannier and Snape, and of others, which are merely bad copies from the imperfect engravings of Carlo Ruini! It is a ſubject of ſtill greater aſtoniſhment, that in the celebrated Royal Veterinary School at Charenton, near Paris, there is not a ſingle ſkeleton of a horſe that I would admit into my cabinet, although they were all mounted by Bourgelat himſelf. In every one of them the ſhoulder-blades and bones of the arms are badly placed. The ſkeleton of the horſe given us by Buffon, and that by La Gueriniere, are ſtill worſe than the preceding.

That of Stubbs is maſterly and accurate; all the parts are properly placed, are in juſt proportions, and well delineated. In his finiſhed pieces the muſcles are repreſented with an accuracy that cannot be exceeded. In a word, his ſkeleton of the horſe, and his arrangement of the muſcles, exhibit ſuch a maſter-piece, that the author deſerves the higheſt honours that were ever beſtowed upon an artiſt.

If artiſts in general ſucceed ſo ill with the horſe, whoſe extenſive utility places him perpetually before our eyes, what is to be expected in the figures of other animals that have not been imitated by a Stubbs?

It is acknowledged, that a minute acquaintance with the anatomy of every animal would require ſo much time, that no artiſt could poſſibly attain it. Obſervation alſo manifeſts, that the moſt renowned artiſts have acquired their celebrity before they were thirty years of age. But an accurate knowledge of the principal parts, particularly of thoſe which I have demonſtrated to poſſeſs a general ſimilitude, is abſolutely neceſſary, both to ſketch the different animals with more expedition, and with a greater degree of preciſion.

This ſeems to have been the method followed by Potter, Berchem, Wouverman, Snyders, Caſtiglioni, and the inimitable Teſta, whoſe works I can recommend for their peculiar accuracy. I ſhall not mention Reidinger, becauſe all his animals, a few of his dogs and deer excepted, are

abſolutely caricatures, and have nothing but the execution to recommend them.

Van Berchem is not perfectly accurate in the diſpoſition of the parts in his cows, aſſes, &c. The ſhoulder-blades are moſtly imperfect, particularly of thoſe repreſented in a front poſition. The heads of his apes are bad. Many of his ſheep are ill delineated, though etched by himſelf. The ſkeleton is uniformly imperfect; yet his books for drawing are the leaſt erroneous. Thoſe engraved by D. Viſcher have the imperfections of their originals; and the hairy covering is much inferior.

In the hunting of the deer, by Dankerts, is a beautiful horſe; but the body of the deer is too ſlender.

Adrian Van de Velde has well delineated moſt of the cows, in his Book of Horned Cattle. The bull, in a ſtanding poſture, is remarkably well drawn; and alſo a grazing heifer, although its feet are ſomewhat too long. In ſome, the hip-bones are too long, particularly in the walking cows. His eating horſe is bad. The head is one-third too ſmall for the height. The prominence on the neck, or withers, is not high enough; and, on account of the ſmallneſs of the head, the neck is of an unuſual length. Some may think that the painter ſhould avoid, as much as poſſible, repreſenting a horſe in the act of grazing, as the extreme length of the diſtended neck is no pleaſing figure. Great addreſs is requiſite to make it graceful.

A grazing cow, which Van de Velde has etched himſelf, is remarkably beautiful.

Paul Potter has etched a bull, which is much inferior to that of Van de Velde. Many of his cows are very imperfect in their form. He is always embarraſſed with the ſhoulder-blade. This appears principally to be the caſe in thoſe that have been etched by M. de Bije.

But you will enquire, Why then do we conſider the pieces of all theſe celebrated maſters as ſo beautiful? The explanation is not difficult. Our own imperfect knowledge of the exact form of animals, renders us contented with whatever is agreeably executed upon the whole. We are enchanted by a graceful attitude, by a maſterly ſtroke of the pencil, or by the high finiſhing of the whole; and this conceals our own ignorance, as well as the imperfections of the artiſt.

The works of D. Stoop are in ſome eſtimation by connoiſſeurs; but all his horſes are ill drawn. The feet are too clumſy, the heads and necks are too ſmall. All his greyhounds are inaccurate. In ſhort, he ſcarcely deſerves the name of a maſter.

What ſhall we ſay of S. de Vlieger? His landſcapes indeed are pictureſque; but his fowls are bad; his hounds are

imperfect in their ſhoulders and fore legs. Neither are his hogs or ſheep accurate.

Peter de Laer has ſketched his goats, dogs, aſſes, and hogs, tolerably well; but his horſes have the ſame imperfections as thoſe of Stoop; and his cows are bad.

Joan Vanden Hecke deſerves no commendation, although he is not unknown to connoiſſeurs. His horſes, cows, aſſes, dogs, in a word, all his animals are badly delineated.

A. B. Flamen has ſucceeded very well in his fiſhes; but his quadrupeds are very inferior to moſt others.

Picart le Roman has left behind him a large collection of lions; moſt of which are ill drawn. Some by Rembrandt are extremely fine; and that by Alb. Durer is beautiful upon the whole; but the heads of all are defective, excepting thoſe by Rembrandt.

Many painters give a diſagreeable phyſiognomy to their animals, through inattention to the pupil of the eye. Although the pupil is round in multitudes, yet in all animals that graze, it is oblong in an horizontal direction. In lions, tygers, cats, &c. it is perpendicularly oblong. In dogs the pupil is not in the centre of the eye, but approaching to the noſe.

Reſpecting the teeth, moſt artiſts are guilty of great errors.

Ph. Wouwerman has not only painted his horſes in a very ſpirited manner, but with more accuracy than I have obſerved in moſt others.

Thoſe engraved by Dankerts, and Joh. de Viſcher, I place in the ſuperior claſs of engravings.

To enumerate every particular would be an endleſs taſk. Let it ſuffice, that I have pointed out to you all ſuch defects in the greateſt and moſt celebrated maſters as might have been avoided, by the manner I am about to explain. But we will firſt examine what C. Vander Pas has done.

This artiſt, in the fifth part of his work, page the ſixth, has propoſed what he deems an eaſy method of ſketching the figure of a horſe, without the rule or compaſs.

He draws a ſquare by the eye (ſee Plate VI. Fig. 6.) A B C D. This he divides into nine equal parts, ſee 1, 2, 3, &c. He then makes three circles; one for the breech, one for the belly, and one for the breaſt and ſhoulders.

C. Van Mander has alſo recommended three circles; and it is poſſible that Van de Pas, who publiſhed his work in the

year 1665, has copied the method of C. Van Mander, which was publiſhed in 1603.

V. de Pas gives a third part of the fourth and fifth ſquares to complete the ſhoulder, and the lower part of the belly. A tenth ſquare he deſtines to the neck; the diagonal of which limits the length of the neck and head.

To the above method it muſt be objected, Firſt, That very few perſons would be able to form theſe ſquares with ſufficient accuracy by the hand. Secondly, The author has not explained the reaſon why the centre of theſe circles ſhould be placed on the oblique lines F G. nor how they are circumſcribed. According to this rule the croſs, or crupper b. riſes higher than the withers at H. whereas the latter, according to Bourgelat, ſhould be one-tenth higher; and, according to Stubbs, it is at leaſt of an equal height. This proportion differs alſo from his own drawings (ſee p. 7, of his Treatiſe). Thirdly, By this method the head of the horſe cannot be one-third of its height; for the height of the withers H. to the bottom of the foot I. is two heads and an half; or rather, the head is equal to one-fifth of the height and length of the horſe. Fourthly, He makes the heel M. and the fore hand N. of an equal height; whereas the latter is the length of one head from the ground, and the former 1 and 1-6th.

Thus it is manifeſt, that the method propoſed is imperfect

and uncertain; particularly when the animal is to be delineated in any other poſture.

The proportions given by Bourgelat are not bad; but the head of his horſe is too ſmall.

The directions of one Heinrich Lauten Saks*, for delineating the proportions of men and horſes, are highly praiſed by Chr. Theoph. Murr. But I have never ſeen that publication.

Vander Pas, in the twenty-fourth page of his Treatiſe, gives the following directions for drawing the cow:

Divide the length A B. (ſee Plate VI. Fig. 7.) into three parts; twice one-third of which, or four parts out of ſix, deſcribe the height of the animal, and one-third its thickneſs. The head is made one-fourth of this line. The other parts are not determinate: nor does a cow ever ſtand with its head ſo high. Thus the method propoſed is of little uſe to the artiſt; for it neither deſcribes the height or ſhape of the withers, back, or loins, nor does it limit the neck.

The ſame author, in his twenty-third table, propoſes the following rules for the elephant. He divides a ſquare into twelve equal portions, and makes an oval for the rump, without giving any determinate ſize. But the whole figure is

* Unterweiſung der perſpectief und proportion der Menchen und Roſſe.

void of proportion. Nor has he delineated the feet in a proper manner. He has made the hind thicker than the fore feet; whereas in elephants, camels, and horſes, the reverſe is obſervable.

The ſkeleton given by Perrault is very imperfect, and out of all proportion. The ſame may be aſſerted of that by Buffon. His repreſentation of the elephant, in Plate I. p. 142, is made after a model that is by no means ſatisfactory.

I am poſitive that the model which I had taken of an elephant is accurate in all its proportions: but it was only a calf, and its head was in reality lower than its back. The head of the elephant delineated by Buffon, has the prominence, or withers, higher than the rump. I was ſurpriſed at this difference; but when I was at Paris laſt ſummer, I ſaw a much larger elephant than that I had modelled, and perceived that the head and withers were higher. This animal was in ſize, between that of Buffon and mine. Thus the proportions I have given are only applicable to younger elephants.

In his twenty-fifth table, Vander Pas has delineated a camel, and he has given an oval for the form of its belly. Every other part is alſo badly drawn. The dogs, repreſented in his thirty-firſt table, are univerſally defective; and alſo the rules he propoſes for drawing the cat.

He alſo propoſes in his forty-third table, three circles for the deer; the firſt ſmaller than the ſecond, and the ſecond than the third; but without explaining the reaſon, or limiting the ſize of either circle.

Since this artiſt is the only one who has attempted to give us rules for delineating different ſpecies of animals, and I have demonſtrated the imperfection of theſe rules, though it is acknowledged that the attempt was highly laudable, I ſhall now proceed to indicate a method that is more ſimple, and much more certain.

GENERAL RULES,

APPLICABLE TO ALL ANIMALS.

See Plate V. Fig. 8.

RULE THE FIRST.

1. Draw the line A B C. according to the propoſed length; or rather, according to the nature of the animal to be delineated; of conſequence inclined, leſs inclined, or more inclined; as in ſheep, camels, &c.

2. Complete the horizontal oval A B C D.

3. Draw the line F E. to mark the ſhoulder-blade; and C H. for the hip-bone; which, for a horſe, muſt be made equal to two-thirds of the head in length; and for a cow, equal to the whole length of its head. Sketch alſo the bone of the arm by E G. and that of the thigh by I K. ſo that the elbow and knee in a horſe, cow, &c. be exactly of a height, and even with the belly.

4. Complete the fore and hind legs; that is, draw K L, M N, N O, O P; and G R, R S, S T.

When R and L are of equal length, the heel M L. naturally riſes higher.

5. Sketch the neck according to the nature of the animal, and afterwards the head, paying attention to the rules already laid down. See the preceding Examples, Lecture II. p. 110.

By recollecting the obſervations made reſpecting the different forms of animals, according to their deſtination; and alſo the difference in the length of the loins, the above ſketch may be made applicable to every caſe *.

RULE THE SECOND.

By ſketching the muſcles of the ſhoulder and fore arm a, Q, g, t, G, f, R. the form of the fore leg will be obtained; and by ſketching c, b, H, c, d, M, &c. the form of the hind leg.

RULE THE THIRD.

The foremoſt rib is always rectilinear, and covered by the ſhoulder-blade. The hind ribs always incline obliquely backwards. In a horſe, they run near to the hip-bone; in a cow, the loins are longer. Hence proceeds the triangular cavity (Plate III. Fig. 2.) E F G.

* See Page 146. No. 12, &c.

RULE THE FOURTH.

In all animals with hoofs, or horny feet, the arms and legs, from the middle to the lower joints, are the longeſt. Fig. 8. R S. and M N.

In all animals that ſpring forwards, as lions, hares, dogs, &c. the thighs are much longer than the legs. See the Greyhound, Plate IV. Fig. 3.

APPLICATION OF THE ABOVE RULES IN DELINEATING FOWLS.

PLATE VI. FIG. 9.

1. Draw the oval as before, and place the arm in A B. which is now folded up, as the bird is in a ſtate of reſt. Draw, in like manner, C D. which may be termed the hand, and D F. which correſponds with the thumb, and D E. the remaining fingers.

2. Draw next G H. the hip-bone and the rump; I K. the ham; K L. the thigh; L M. the leg; and M. the claws.

3. Draw the neck Q N. proportionate to the height of the body, and complete the head Q R. In ſome fowls the upper jaw, or beak, is very moveable, to the extent of R S. as in ducks, &c.

4. If it be a flying fowl, the breaſt-bone muſt be furniſhed with a large rib, deſtined to the inſertion of muſcles (the oſtrich and caſſowary are deſtitute of this) and alſo with an arched bone (the merry-thought) N O. for the ſame purpoſe.

By filling up with muſcles, the form of the thigh, &c. is obtained; by placing the feathers upon theſe, the whole form of the fowl. Cover firſt the wings, then the thighs, &c. *

OBSERVATIONS.

I. In order to place the centre of gravity forwards, Nature has formed in all fowls the back very ſhort, and made them deſtitute of loins. Many fowls have only ſix vertebræ, and conſequently not more than ſix ribs on each ſide; which is ſcarcely more than one-third of the ſeventeen vertebræ with which the human ſpecies is furniſhed. In the frog, in which the centre of gravity is neceſſarily thrown backwards, the reverſe takes place. It was neceſſary that this animal ſhould retain the loins, in order to throw the ſtrength of the muſcles into its thighs and hind legs. Thus has the Supreme Creator rendered it almoſt deſtitute of a back, and placed the head contiguous to the loins. For the ſame reaſon it is deſ-

* Belon de Mans has given two ſkeletons, the one of the human form, and the other of birds; in which he has repreſented the reſemblance of all the bones from the head to the feet, in a very ſatisfactory and elegant manner. I had not taken notice of this before the year 1779. See *Hiſtoire de la Nature des Oiſeaux*, publiſhed in 1554. pages 40, 41.

titute of ribs, and hence does its body appear ſo extremely ſhort.

II. Since it has been ſhewn that the fore feet of all animals are correſpondent with the wings of birds, and alſo with our arms, it is to the higheſt degree abſurd to give wings to the human form; as is the practice in the repreſentation of angels, Cupids, &c.* In like manner the exiſtence of a centaur is impoſſible. For this quadruped would in reality have ſix feet, double breaſts, and two diſtinct bellies. That neither tritons nor mermaids can exiſt, will appear from the above remarks concerning the form of birds.

* It is obſervable, that in all the birds which fly, the pectoral muſcles conſtitute the principal part of their bulk: peculiarly ſtrong muſcles being neceſſary to communicate ſuch force to the wings, that they ſhould be able to ſuſpend the body in the air, and to propel it forwards. Were the painter to furniſh his angels with theſe muſcles, they would become monſters; without them, he ſuppoſes an impoſſibility. This idea might be extended much further. In the human form, a maſs of pectoral muſcles, infinitely larger in proportion to that in fowls, would be requiſite, in order to overcome the weight of man's poſteriors; which being intended to enable him to walk firmly upon the earth, prevents him from ſpringing more than a few feet above it. Would not painters therefore do wiſely to leave thoſe unmeaning fans, and, in their repreſentation of celeſtial beings, truſt to the lightneſs and elegance of their forms, and divinity of their countenances? If cuſtom has ſo far conſecrated wings, that they cannot be diſpenſed with, ſurely much more care ſhould be taken than is generally obſervable, that they be not made to carry a greater weight than is abſolutely neceſſary.

APPLICATION OF THE ABOVE RULE IN DELINEATING FISHES.

PLATE VI. FIG. 11.

The ſimilarity of fiſh to quadrupeds may be demonſtrated in the following manner:

1. Draw as before the oblong oval B A C G. as in Plate V. Fig. 8. Since the fiſh neither have nor require a neck, excepting thoſe that reſpire, which are furniſhed with a ſhort one, place the head D A B E. immediately upon the back-bone A.*

2. As the rump has no diſtinct and ſeparate motion, though it is in equipoiſe with the water, a power is required ſimilar to the oar of a boat (ſee ▵ ⊓ ⊙ of Fig. 11.) to which the fiſh may now be compared. As great mobility is requiſite in a fiſh, it is obvious that the tail C H. becomes neceſſary; and alſo the large tranſverſe bones for the inſertion of the muſcles. In proportion as ⊓ ⊙, or the tail, is long, will the fiſh be able to move itſelf with the greater velocity.

* In all fiſh the head is joined to the firſt vertebra, through the medium of cartilage, in like manner as the vertebræ are united with each other.

INFERENCES.

INFERENCE I.

The boat would be the moſt ſteady, were the centres of motion and gravity to unite in the ſame point. This is impoſſible in a boat, but it always takes place in a fiſh. Hence it is that fiſh are able to ſwim in a right line; whereas the fore part of the boat muſt move from ſide to ſide. But the fiſh muſt keep itſelf in a ſtraight line, and it is furniſhed with fins for this purpoſe, both upon the breaſt B F. and under the belly at G. Take away B F. and the fiſh will fall upon its ſide.

INFERENCE II.

1. Since fiſh are naturally in equipoiſe with the water, and they all ſwim, or row themſelves forwards by means of the tail, it follows, that their poſition in the water muſt be horizontal.

2. The centre of motion will vary according to the weight of the head; and upon this circumſtance will depend the length of the tail.

3. Since greater diverſity of form can take place in fiſh than in quadrupeds, there is ſpace for a much greater diverſity of ſpecies in the firſt than in the laſt.

4. The exiſtence of ſuch ſea-monſters as mermaids and tritons is impoſſible, and the idea of them abſurd; as theſe animals muſt be ſuppoſed to ſwim in an erect poſition, the tail forming an acute angle with the back; whereas the centre of gravity would unavoidably force them into a right line. But to return.

Since fiſh move by means of the tail, they have no occaſion for thighs, legs, or feet. Alſo, from the nature of their food, they do not in general require an oſſified jaw, as in quadrupeds and fowls.

The Natural Hiſtory of the Frog affords us a curious and ſtriking example of the changes reſpecting theſe circumſtances, appointed by the wiſe Creator, in conformity to the exigencies of the animal. The frog is provided with a tail, as long as it is deſtitute of feet; but when theſe protrude, and have acquired ſufficient force, the tail gradually contracts, until it totally diſappears. This ſingular phænomenon might be contemplated every ſpring, were not the animal too common, and deemed too inſignificant to attract our notice.

THE TRANSFORMATION OF QUADRUPEDS INTO BIRDS.

PLATE VII. FIG. 12.

To change a cow into a crane.

1. Draw the ſkeleton of the cow as in the Second Example, p. 151.

2. Raiſe this upon the rump, as in G C. and the fore feet muſt neceſſarily riſe from the ground.

3. As the centre of gravity can no longer be ſupported by the aſſiſtance of the fore feet, the hind feet E F. muſt be brought forwards to F I.

4. The carcaſe, or body, being raiſed ſo much higher above the ground, the neck muſt be extended to G H. and the head muſt be placed backwards to be ſupported in H I. the line of gravity.

5. The fore feet not being any longer neceſſary, are changed into wings, which are to be formed according to the Fourth Rule, p. 66.

6. As fowls are protected by their feathers, from being teaſed by flies, &c. a long tail is not neceſſary; for this, a ſhort and very moveable tail is ſubſtituted to aſſiſt their flight.

THE TRANSFORMATION OF A QUADRUPED INTO THE HUMAN FIGURE.

PLATE VII. FIG. 13.

In order to avoid a multiplicity of lines, which would create confuſion, it is beſt to repreſent any quadruped upon its four

feet; the horſe, for example; and afterwards to place him erect upon his hind feet. The following changes will naturally follow:

1. The hips will be compreſſed into a right line with the hams or thighs.

2. The fore feet will hang downwards, cloſe to the ſides of the animal; hence a clavicle will become neceſſary.

3. The thighs and legs will now be rectilinear.

4. The head need not be placed upon a long neck, as the animal cannot graze in this poſition; and therefore the prominence above the ſhoulders, or withers, becomes unneceſſary.

5. The back, in conſequence of theſe alterations, is flatter.

6. The brains being of a larger volume, and placed before each other, require the head to be of a rounder form; and the centres of motion and of gravity muſt unite in the ſame point.

7. The maxilla being neceſſarily drawn inwards, the noſe projects beyond them.

8. The feet become ſhorter, and terminate in five toes.

N. B. It follows, from the Third Rule, that the thighs and calves, as well as the poſteriors, muſt be made proportionably thick to ſupport the body in an erect poſition. This has been judiciouſly remarked by Ariſtotle, "*Homo unus cauda vacat, nates habet, quod nulli quadrupedum datum eſt. Crura etiam homini femore ſuraque carnulenta ſunt. — Quorum cauſa una eſt omnium, quod homo ſolus animalium erectus eſt, itaque nates carnoſas fecit, et femora et ſuras.*"

Thus, Gentlemen, have I accompliſhed the taſk which I had impoſed upon myſelf, by pointing out to you the analogy that runs through animal nature. If I have not ſucceeded to your expectations, in preſenting the rules ſo clear and deciſive as might have been wiſhed, I hope I have awakened your curioſity, by having made you more acquainted with the general plan of the Creator, in the formation of animals; and demonſtrated that a minute acquaintance with this will beſt enable the ſtatuary and painter to excel in the different branches of their art.

THE END.

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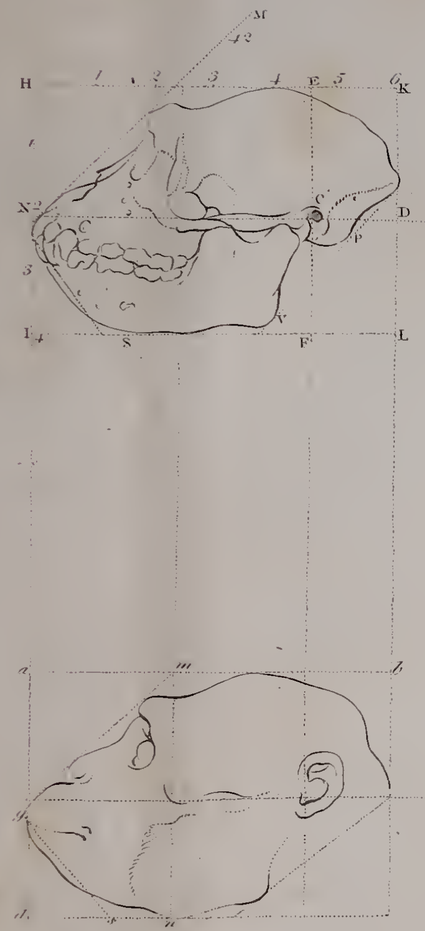

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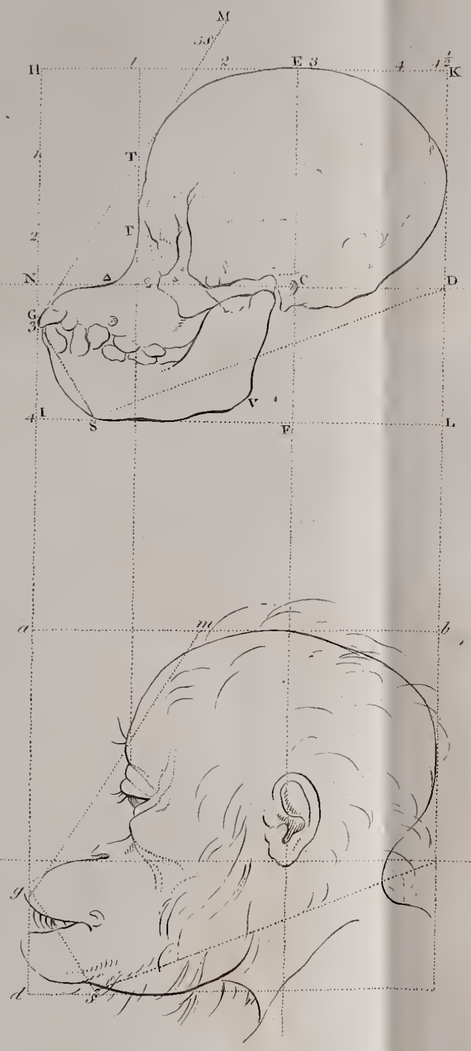

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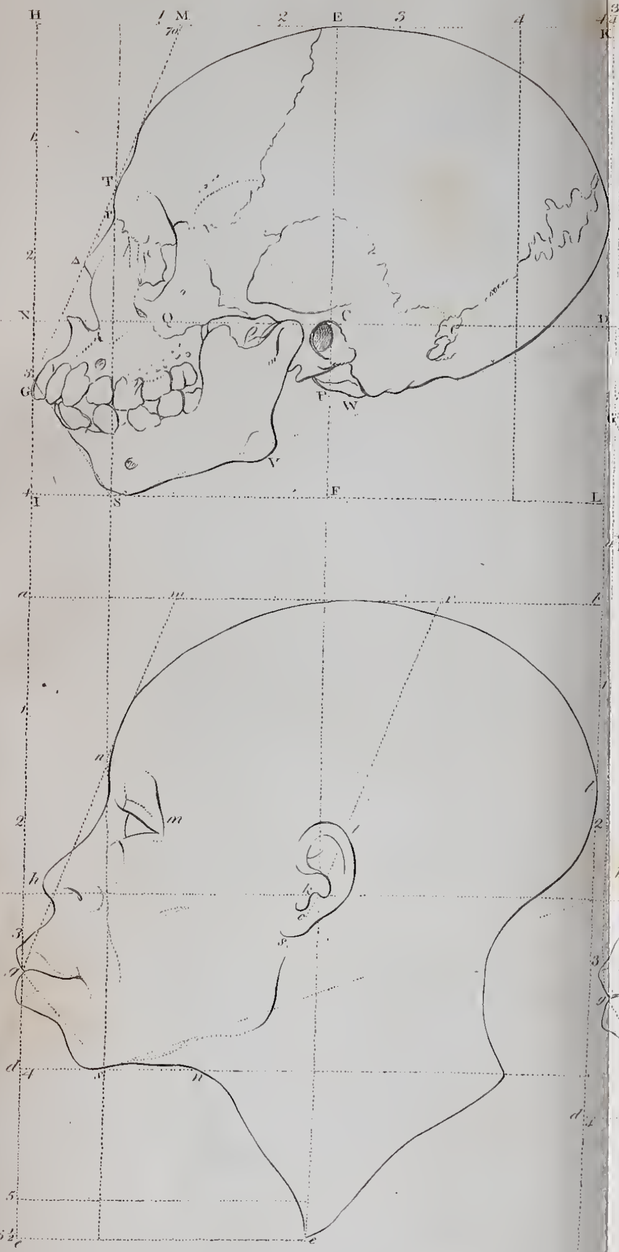

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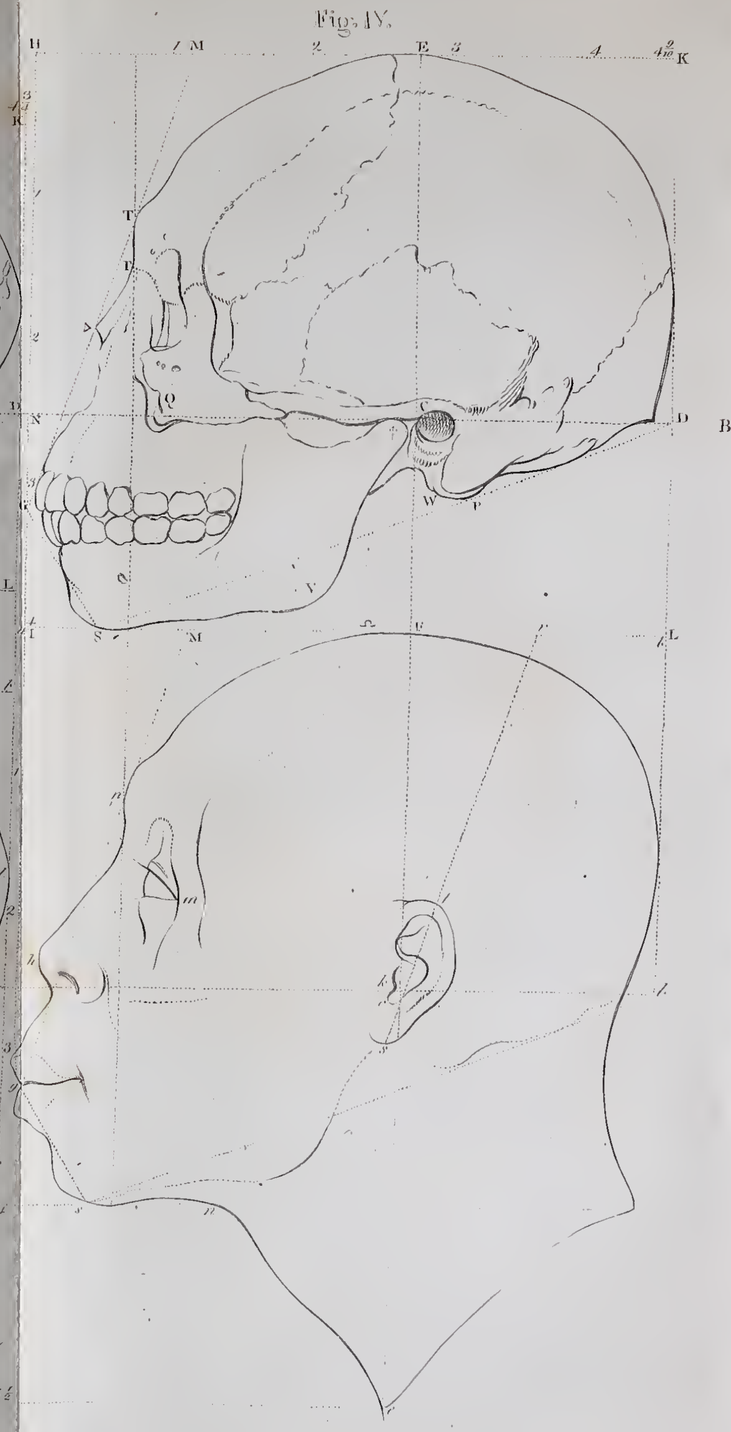

N. Kirk sculp.

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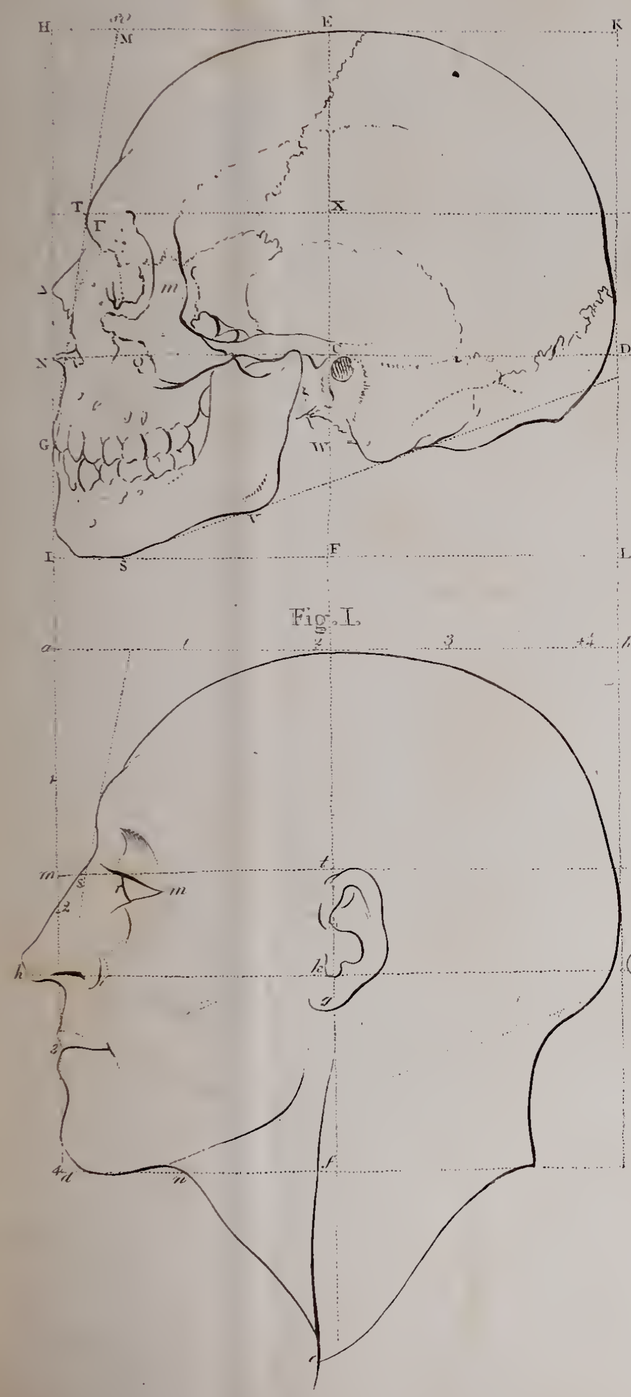

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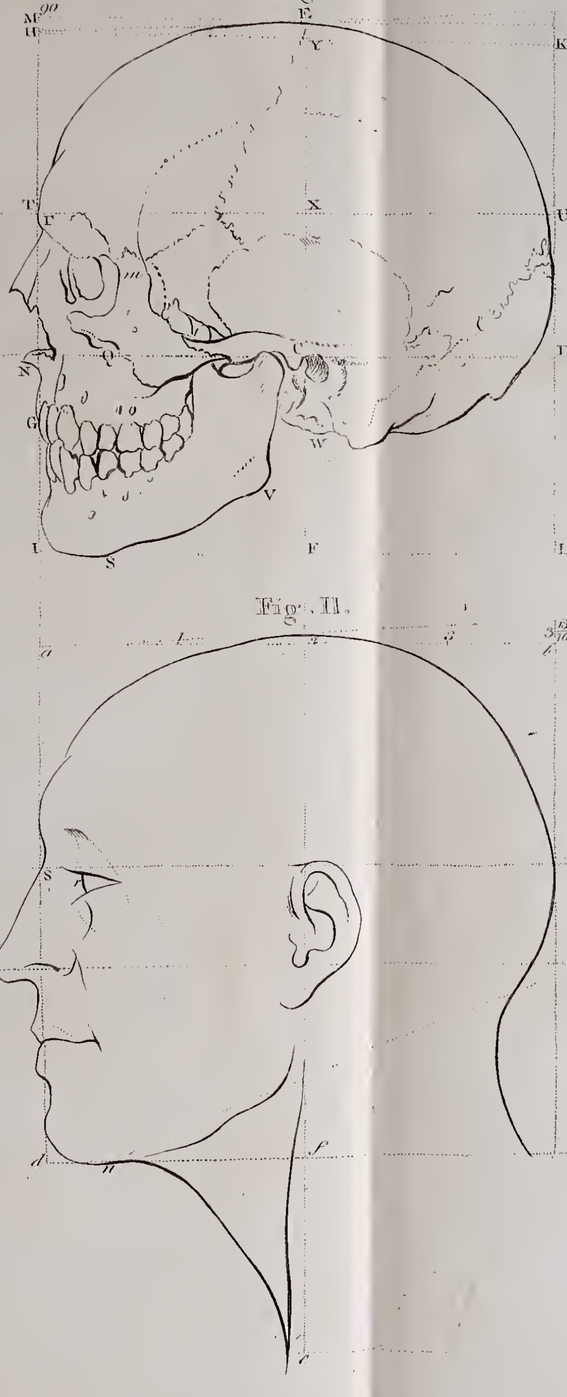

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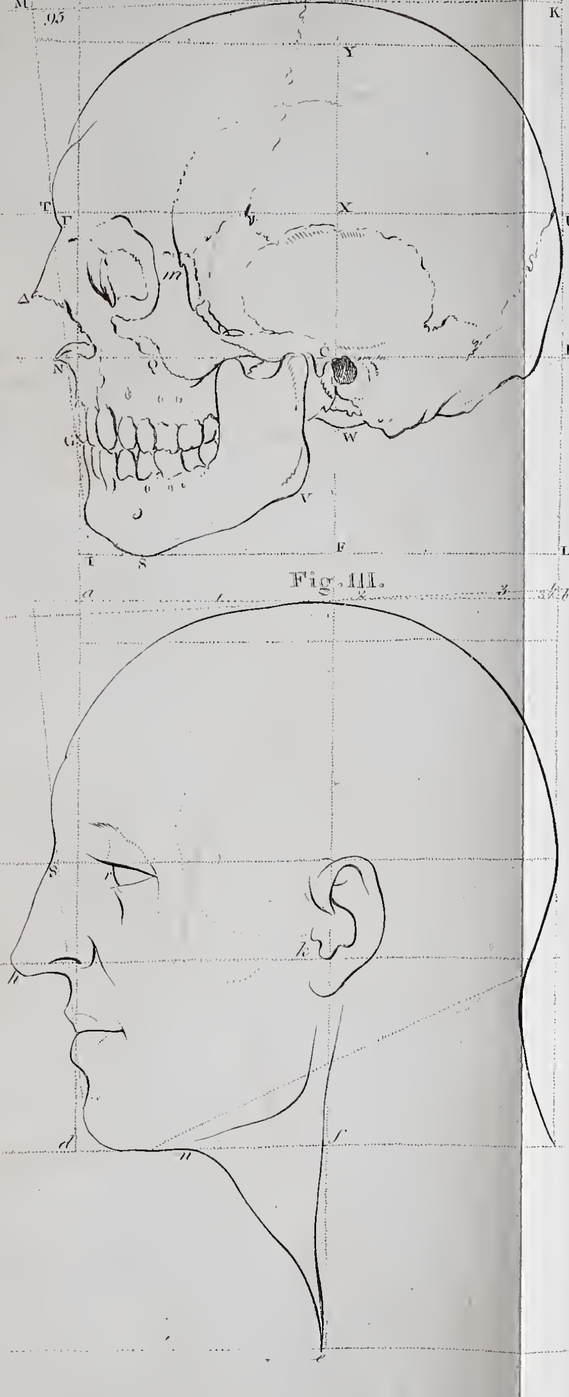

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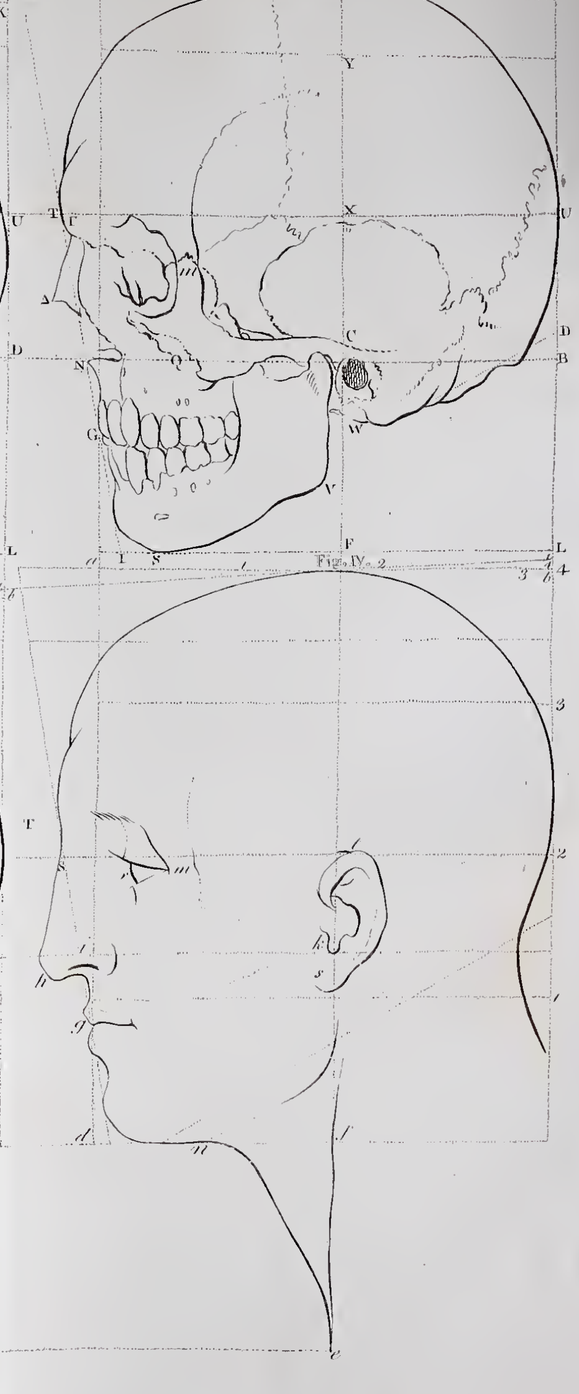


Fig. I.

Fig. II.

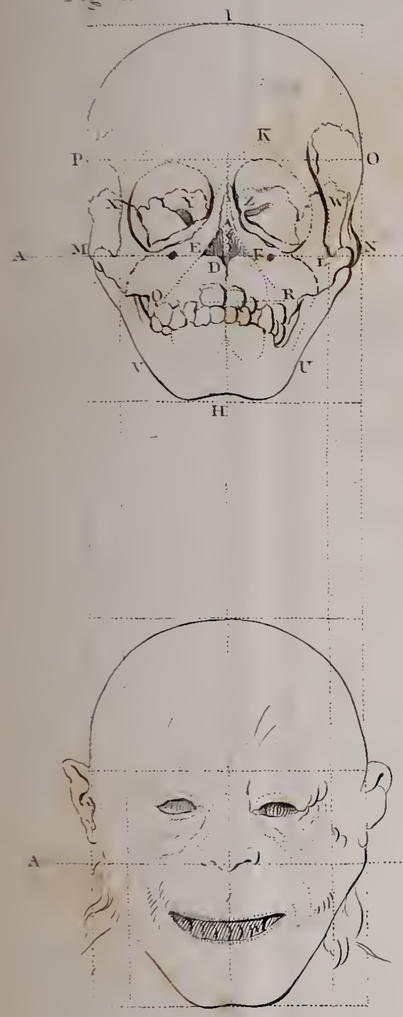
Fig. III.

Fig. IV.

F. Heck sculp.

TAB. III.

Fig. I.



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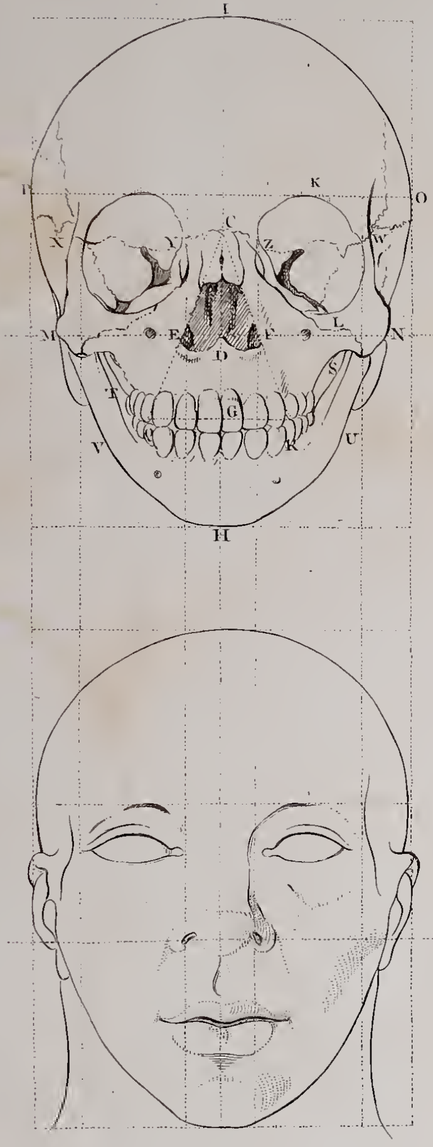

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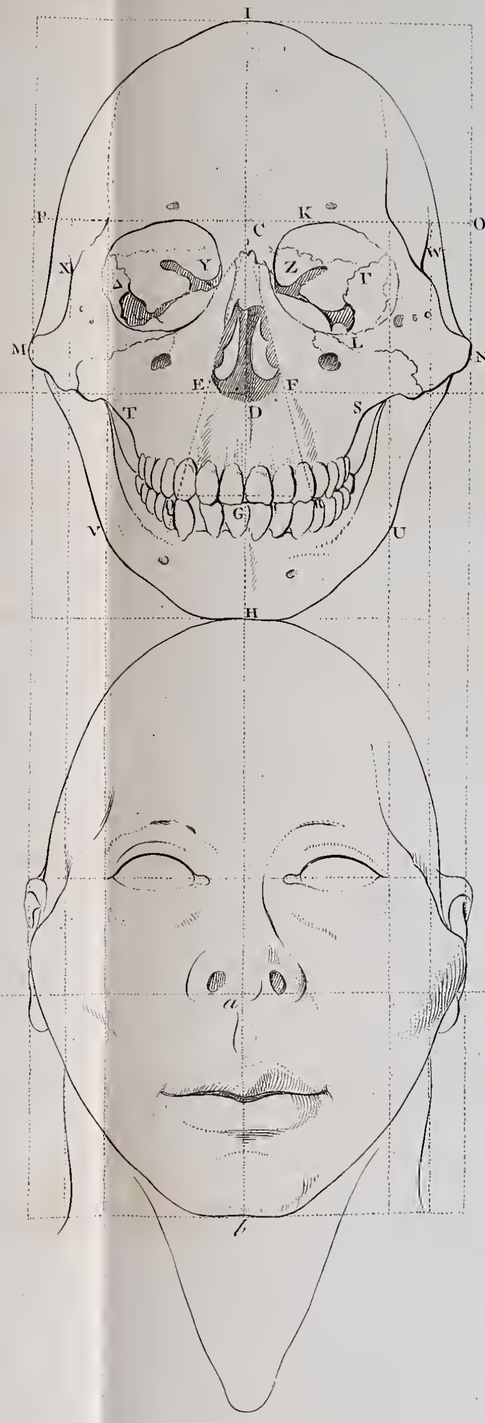

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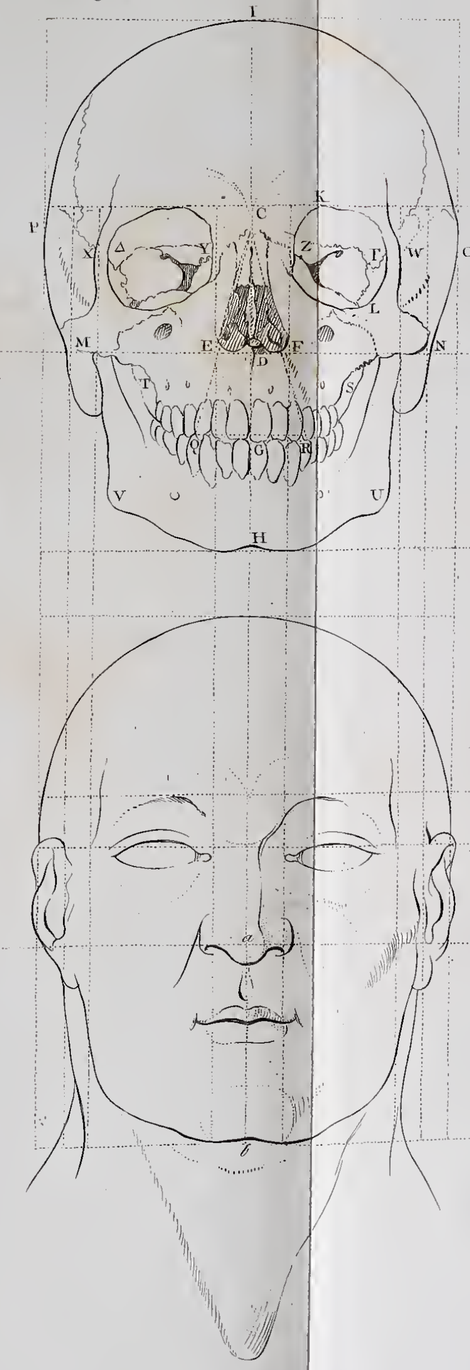

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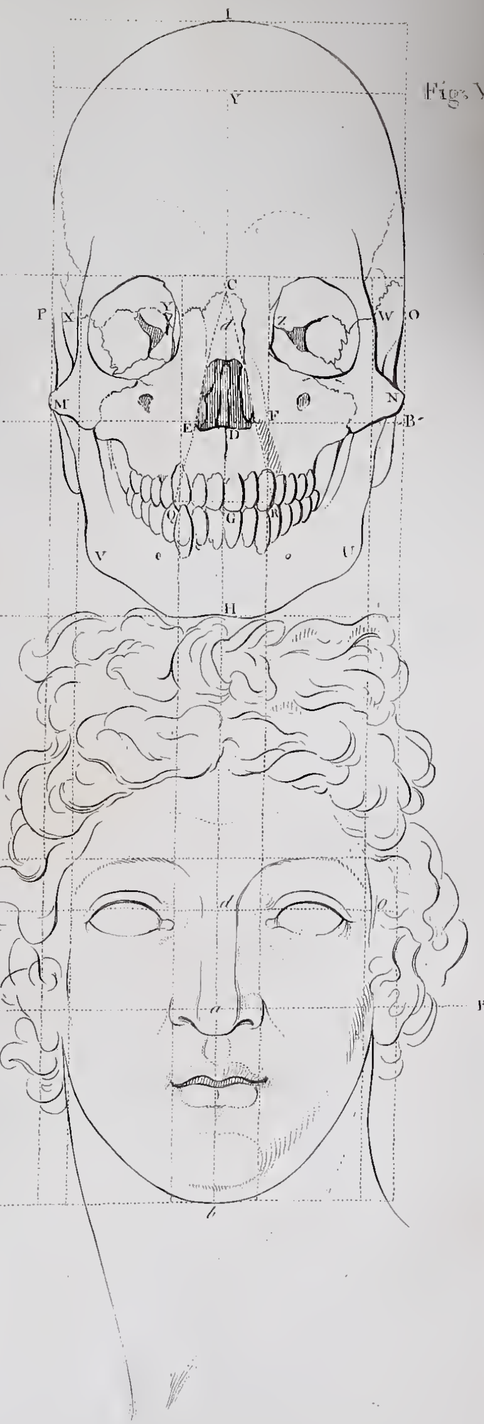

T. Birk sculp

TAB. IV.

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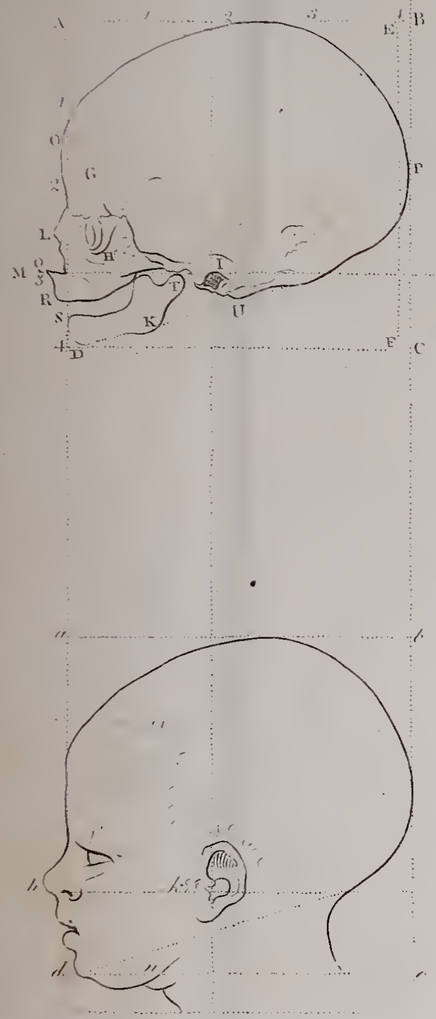

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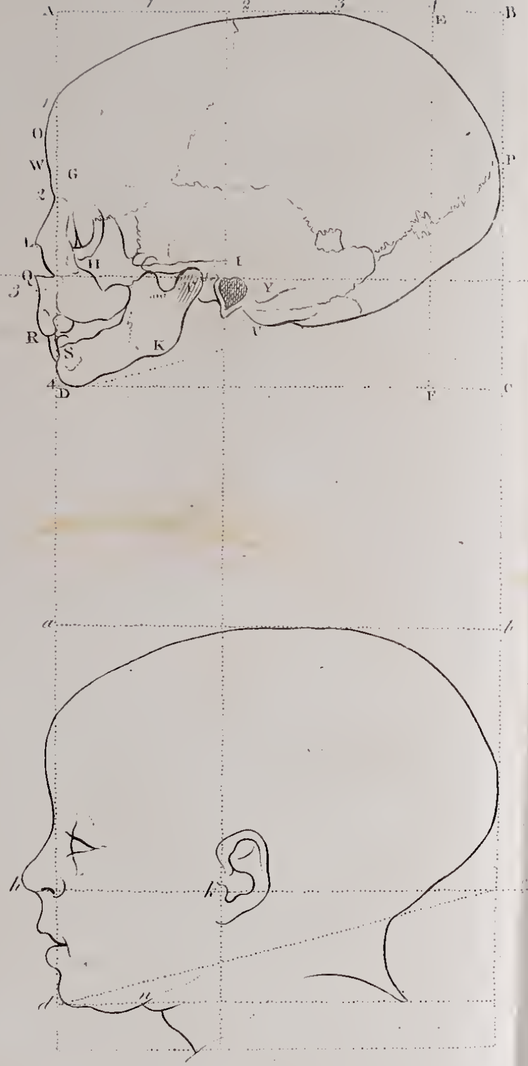

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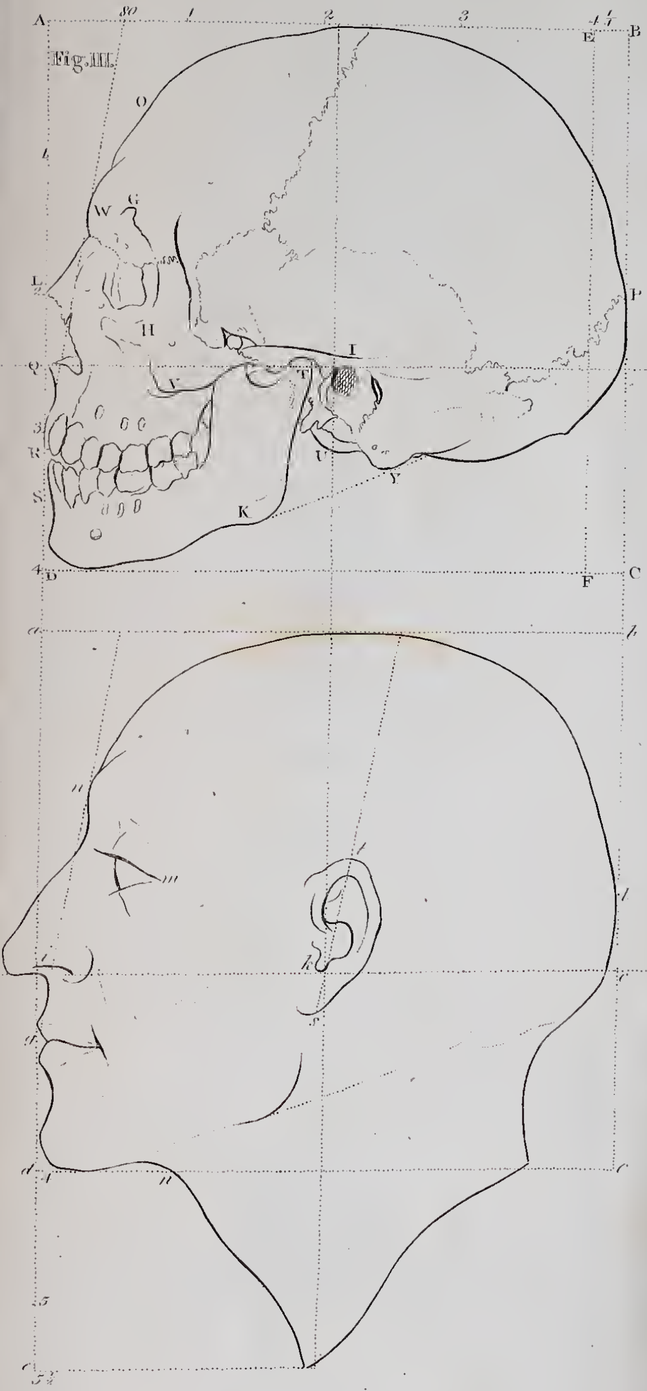

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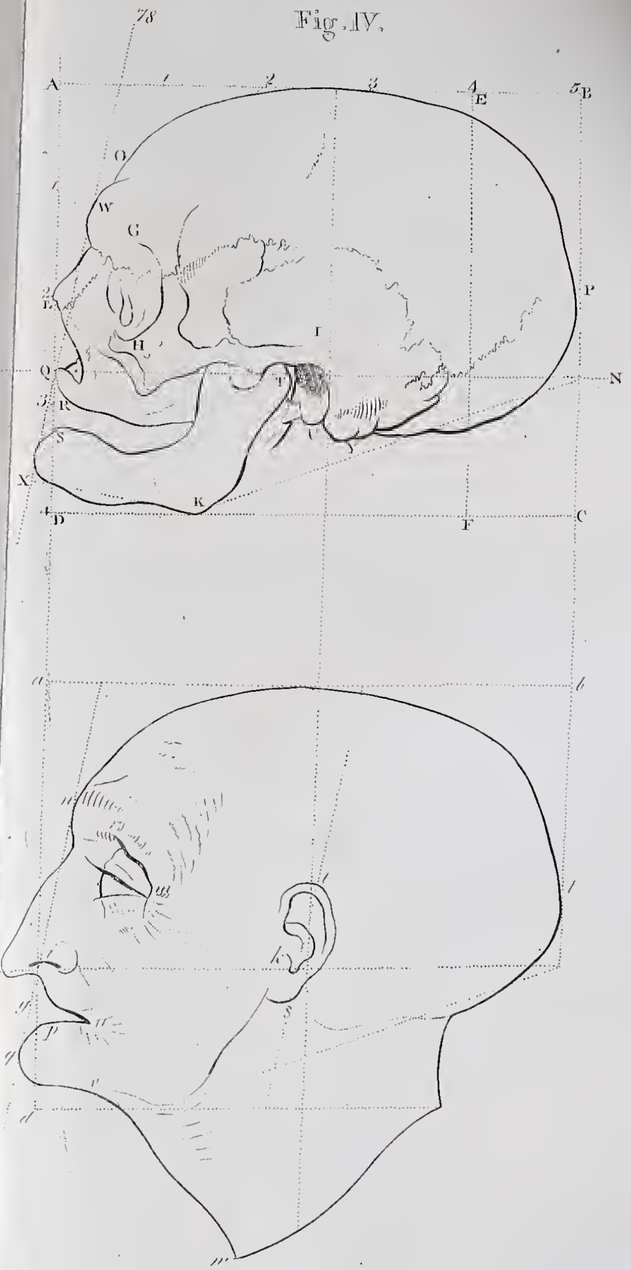

T. Kirk. sculp.

TAB. V.

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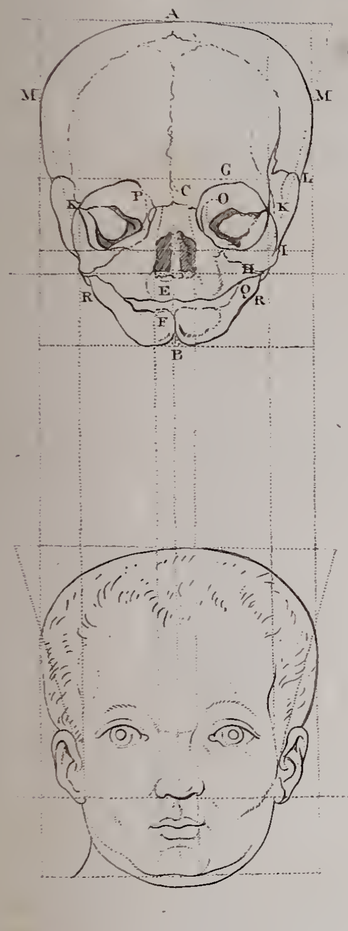

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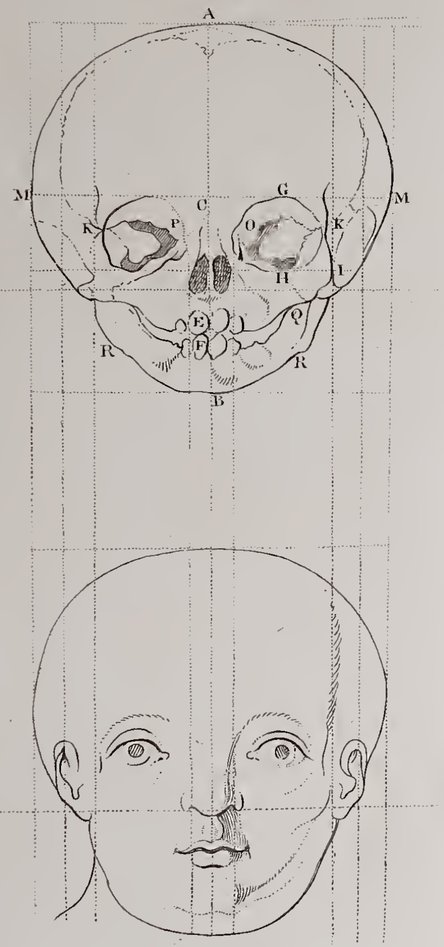

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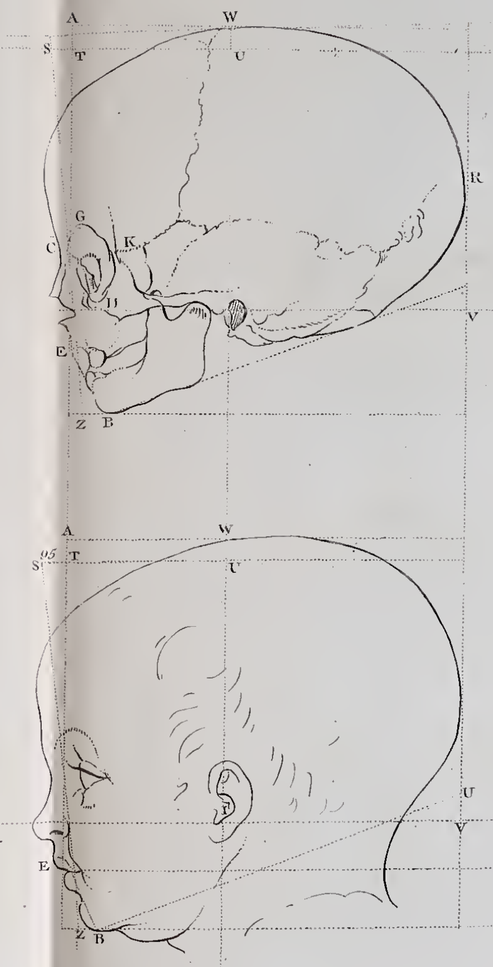

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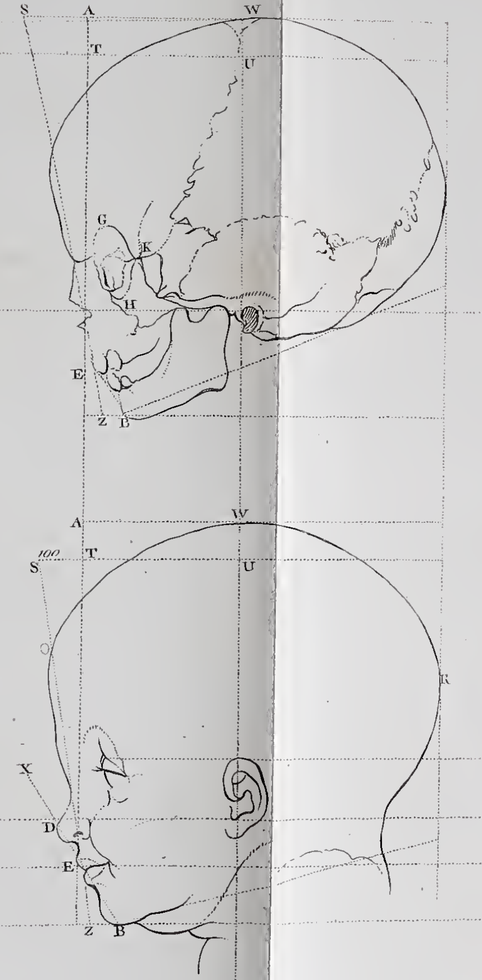

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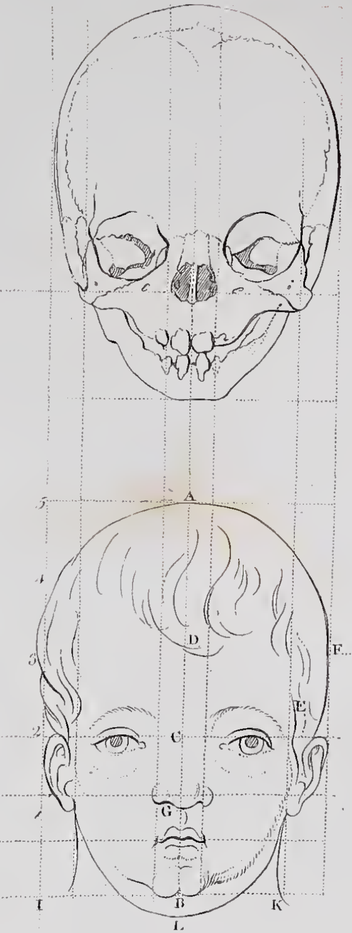

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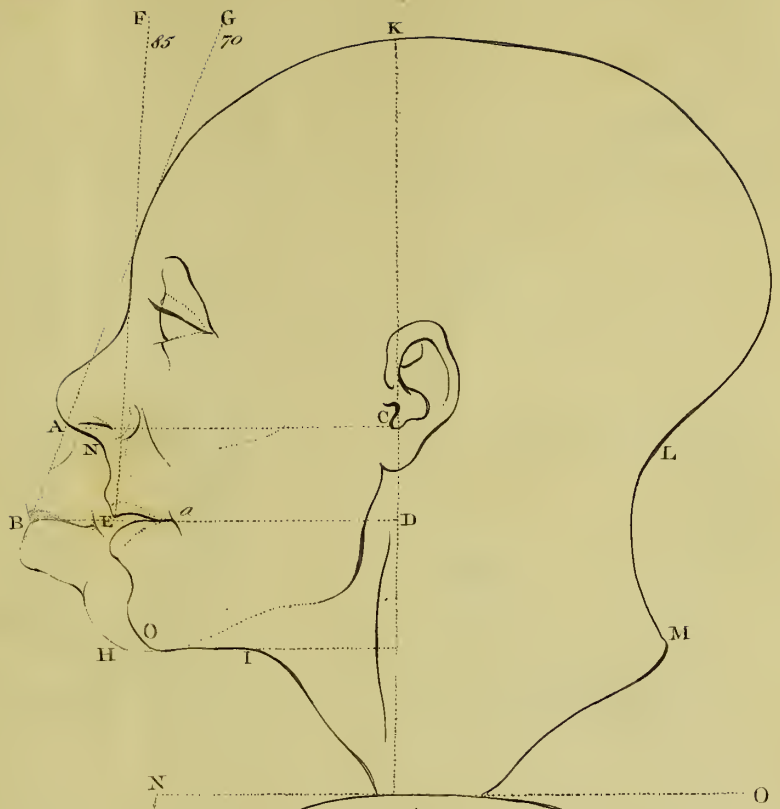

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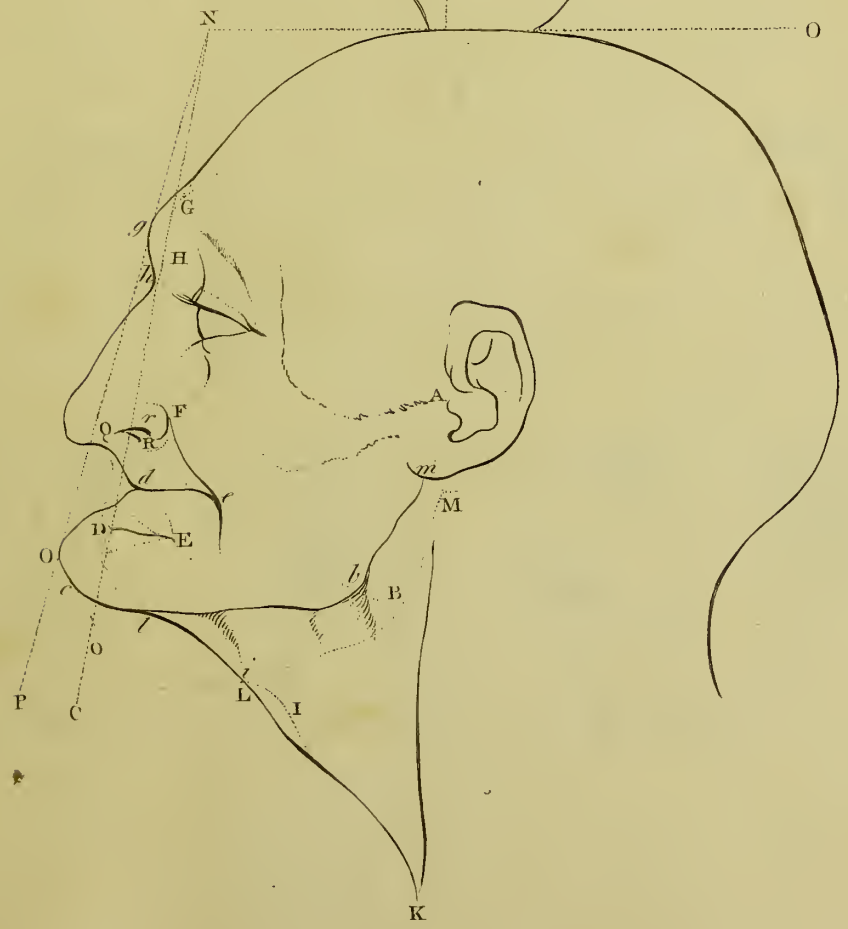
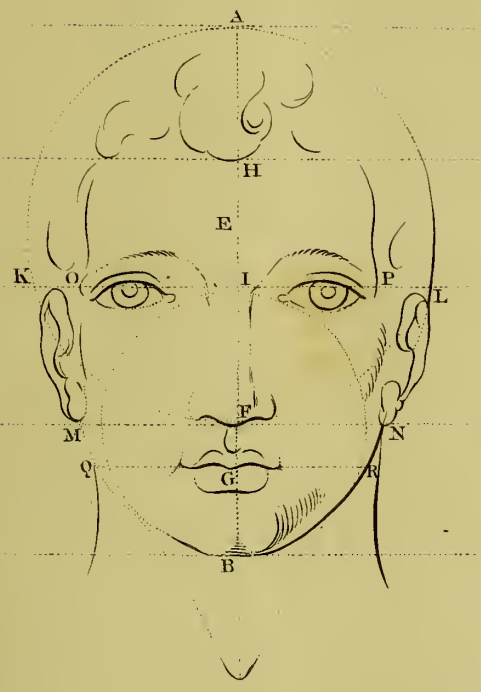


Fig. II.

T. Kirk sculp.

Fig. I.



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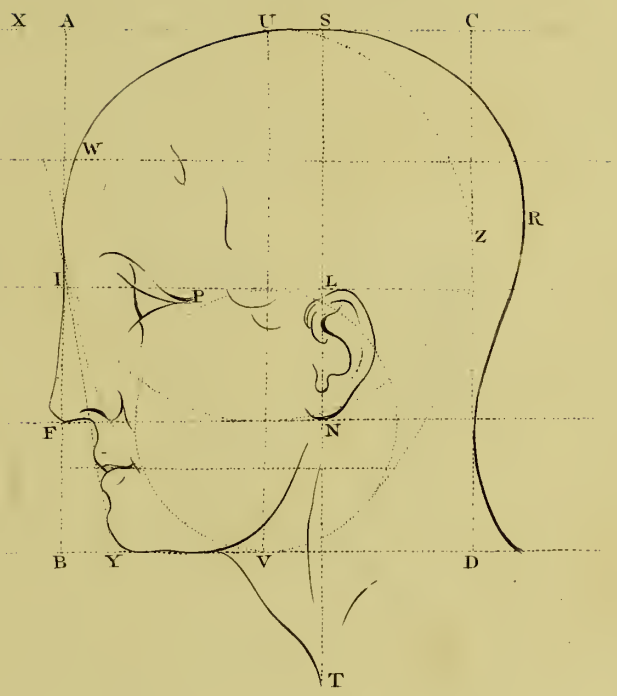

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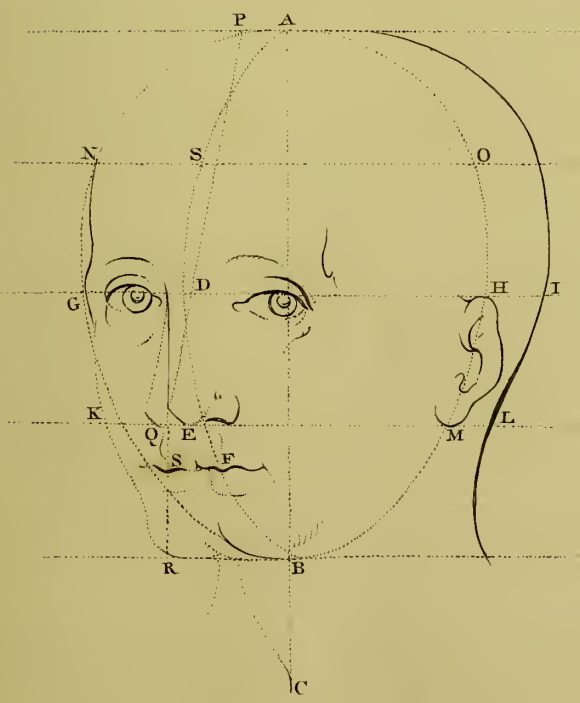

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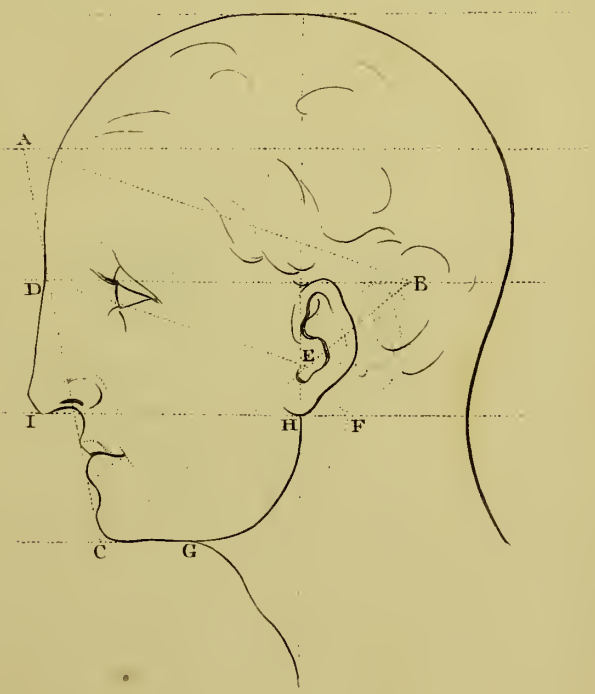

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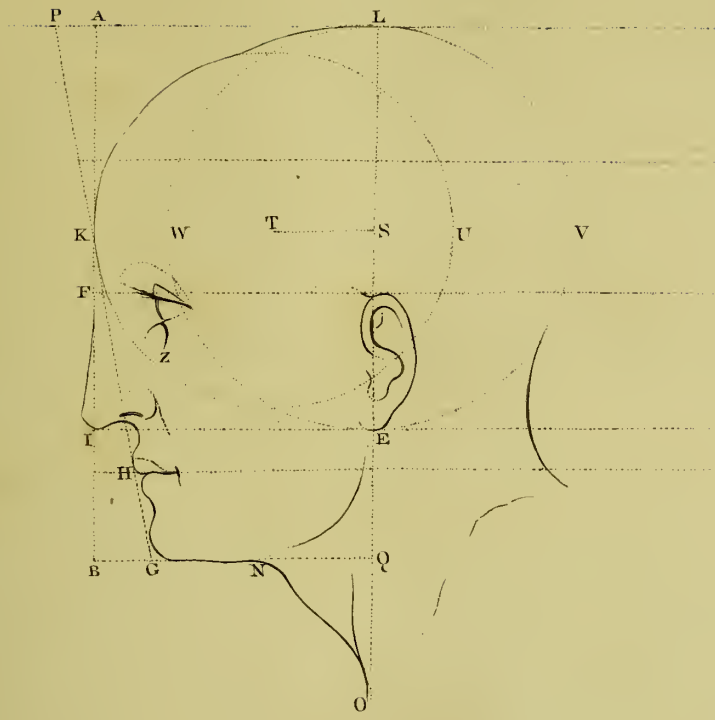

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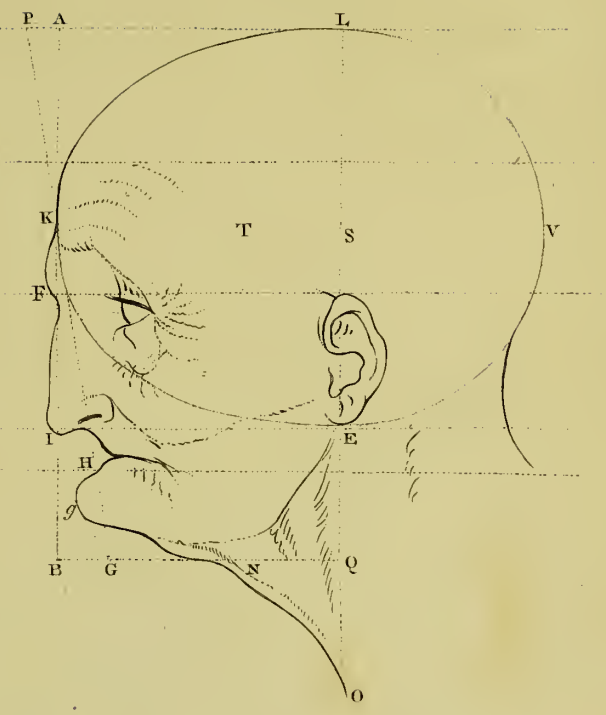

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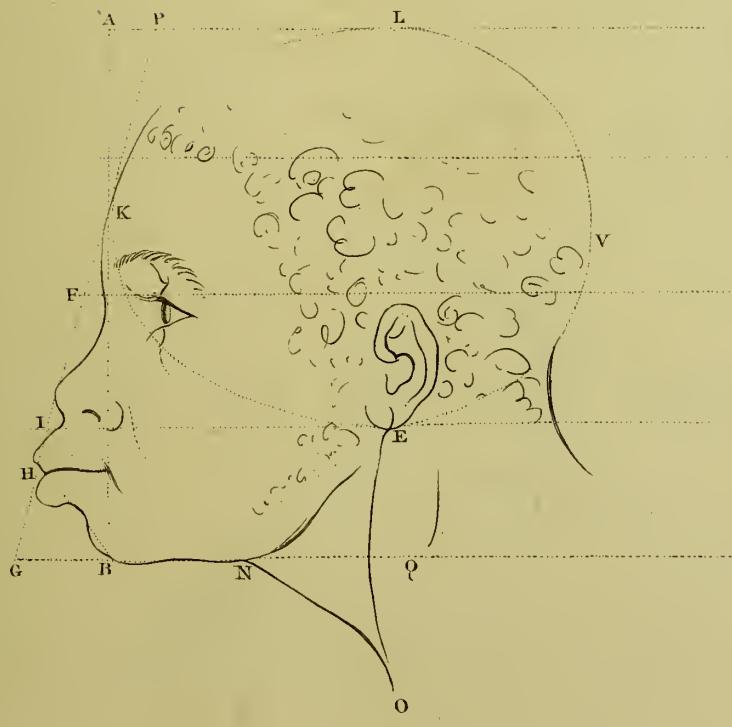

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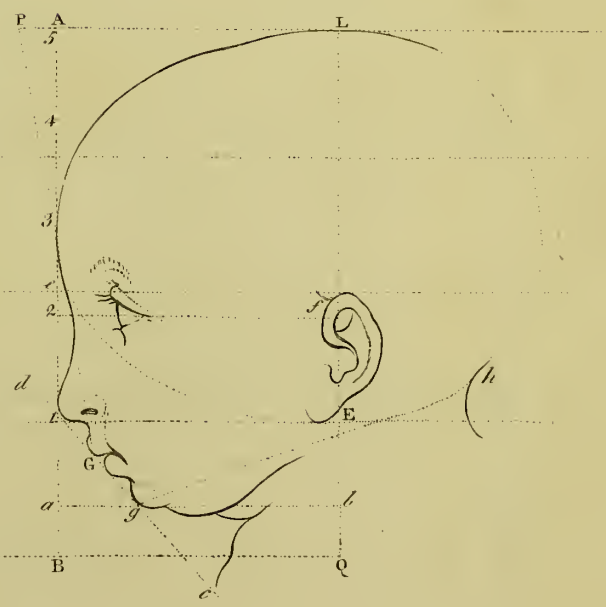

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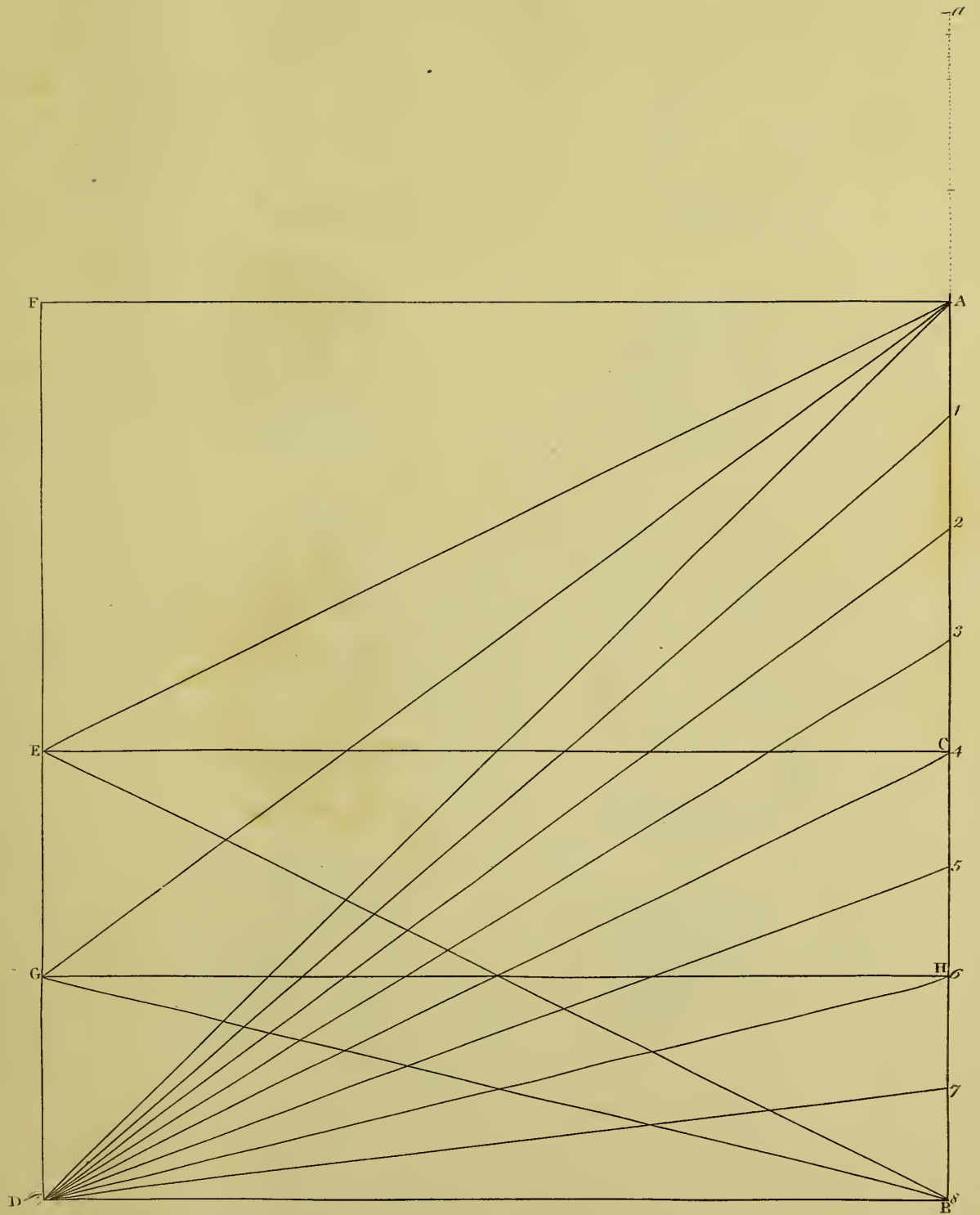
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Fig. I.

Fig. II.

Fig. III.

Fig. IV.

Fig. V.

Fig. VI.

Fig. VII.

Fig. VIII.

T. Kirk sculp.

PL. I.

Fig. 1.

Fig. 2.

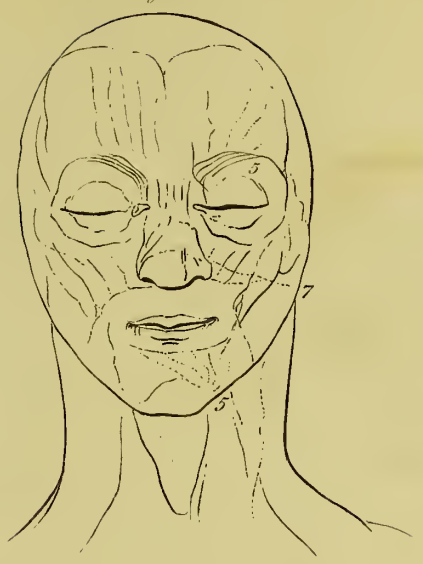


Fig. 3.

Fig. 4.

Fig. 5.

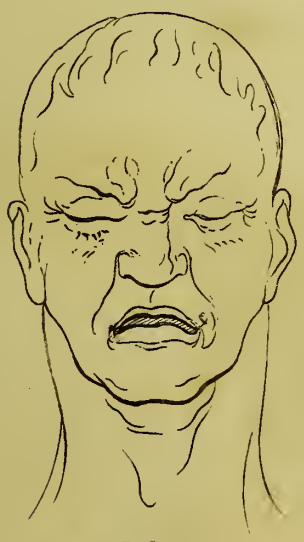
T. Kirk sculp.

PL. II.

Fig. 6.

Fig. 7.

Fig. 8.



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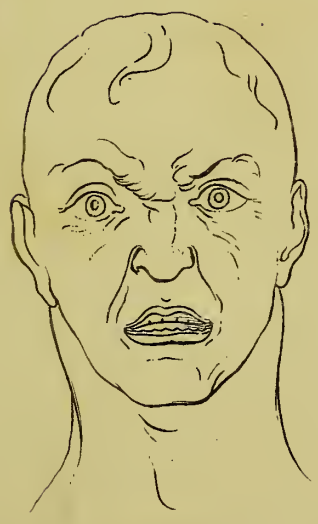

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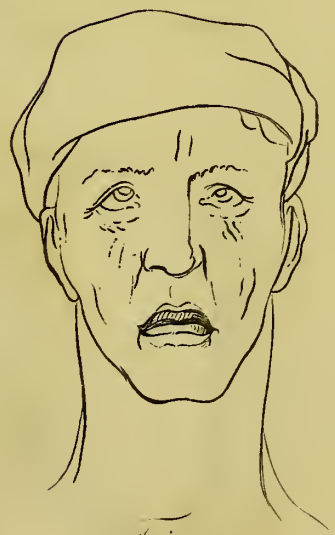

Fig. 11.

T. Kirk. sculp.

PL. III.

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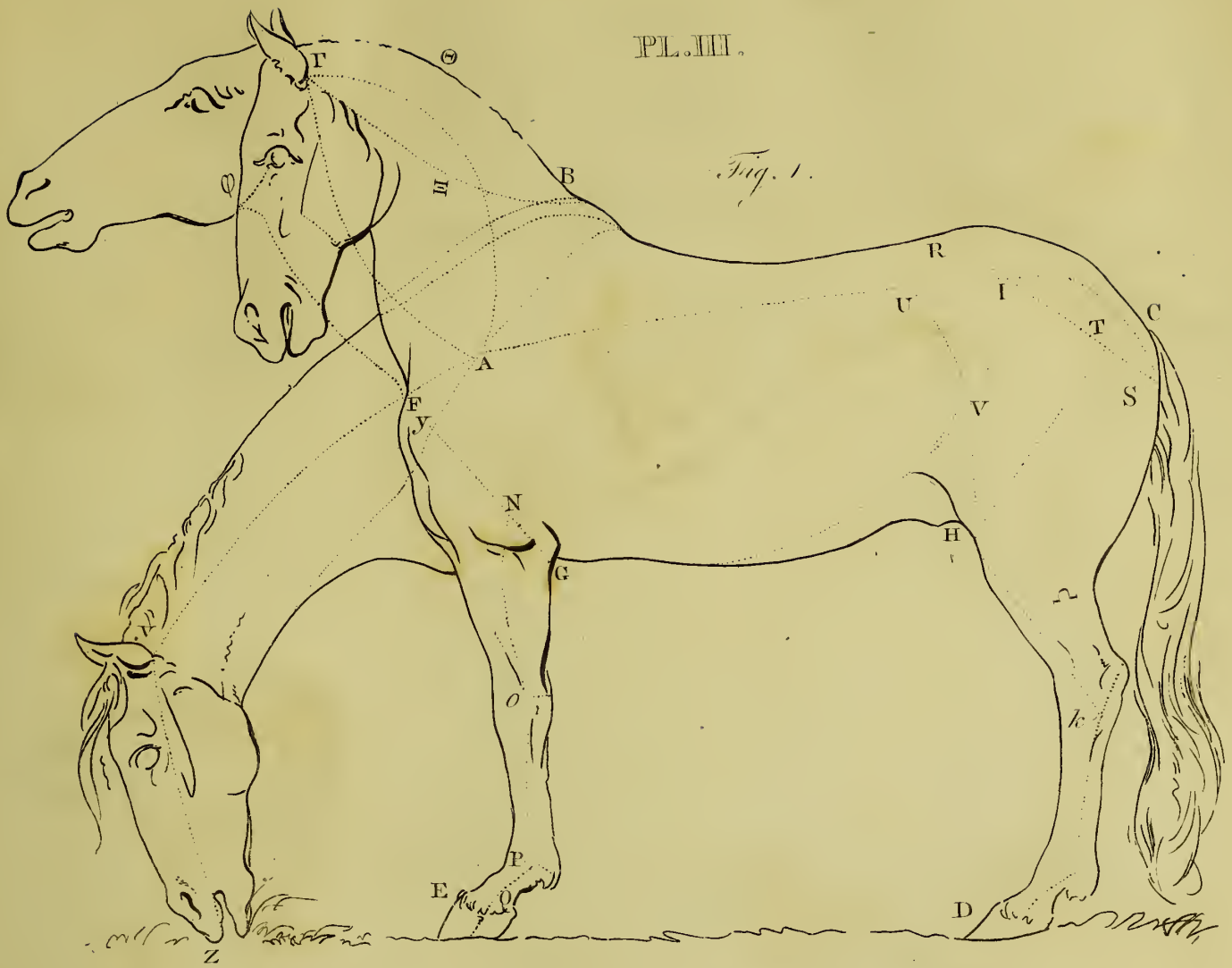
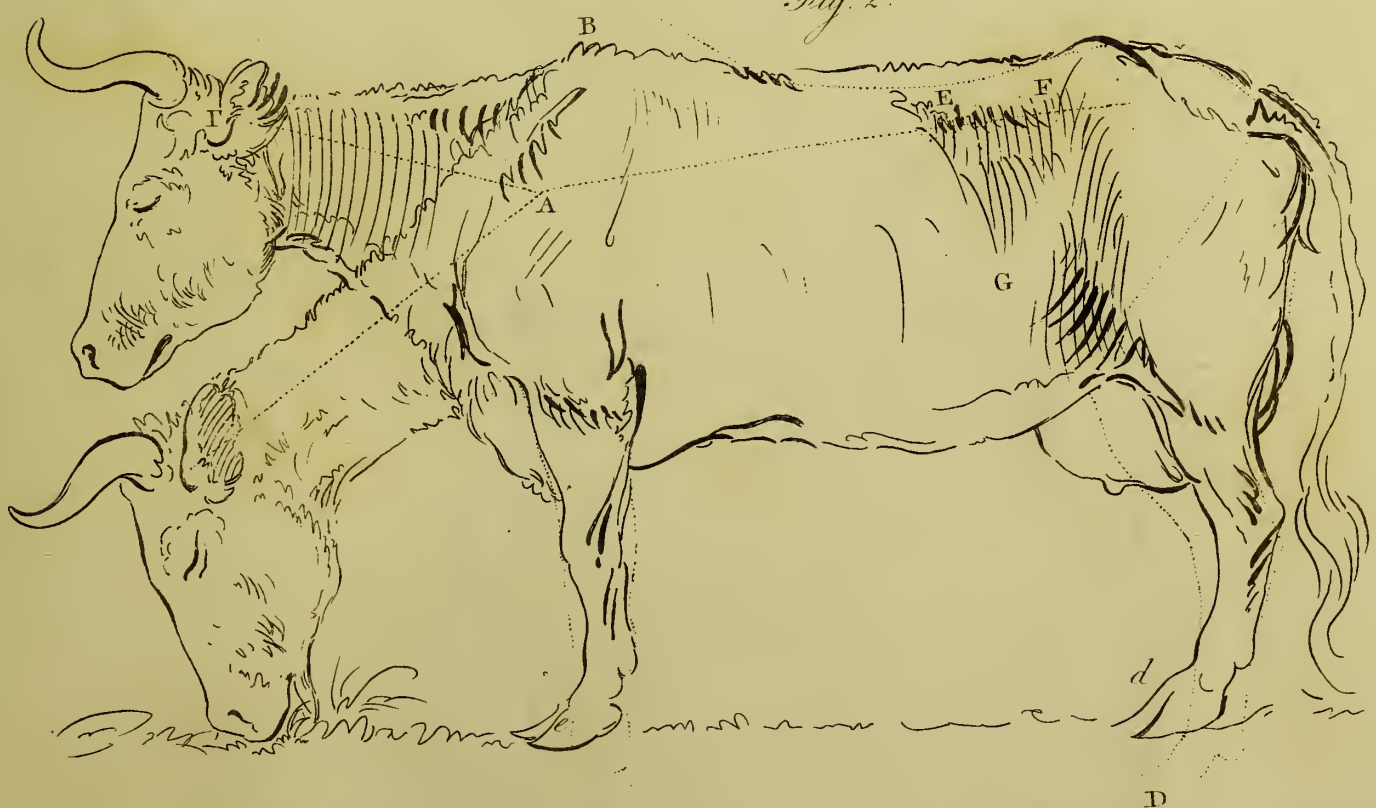


Fig. 2.



T. Kirk sculp.

PL. IV.

Fig. 3.

Fig. 4.

T. Hick sculp.

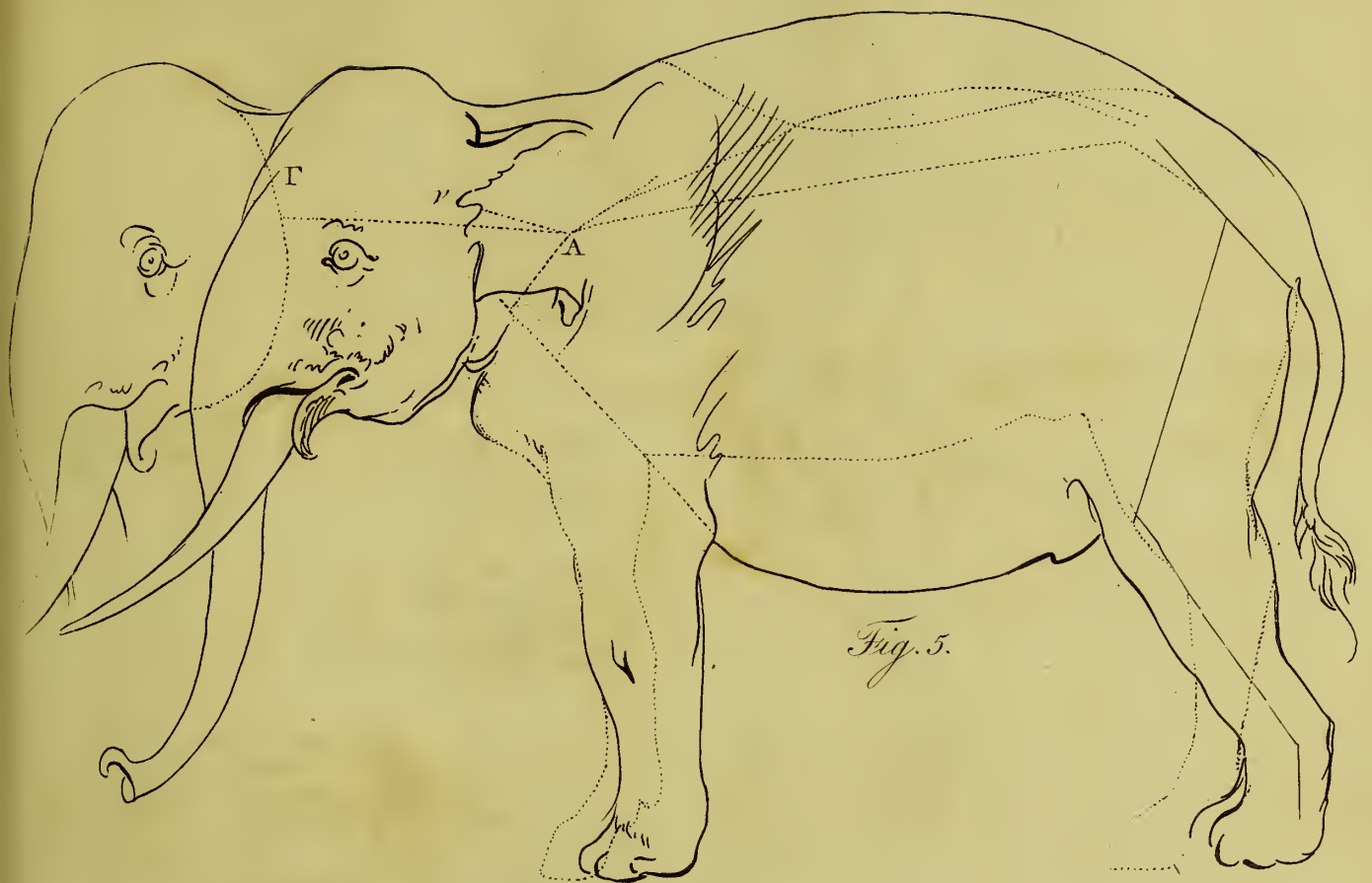


Fig. 5.

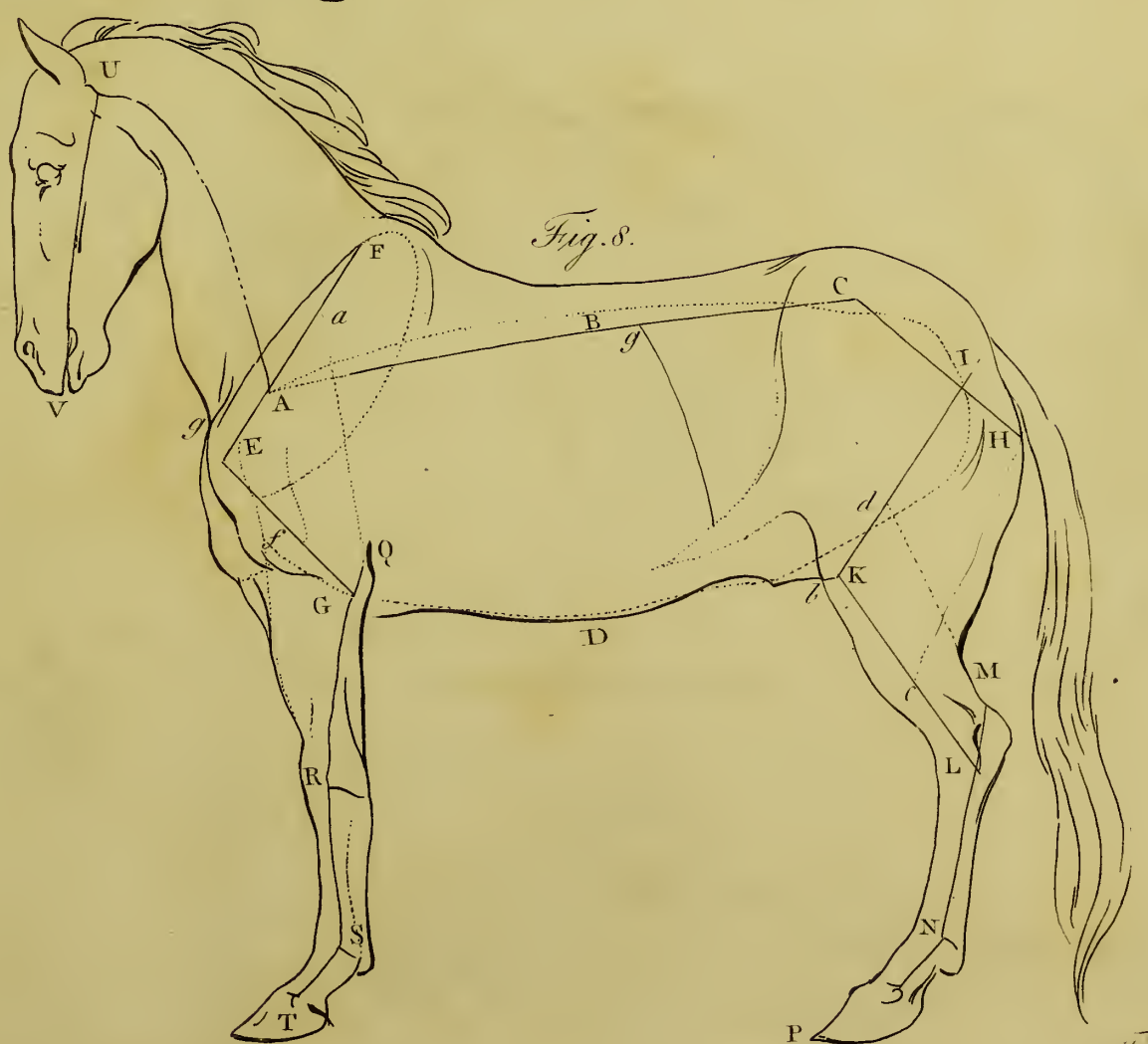
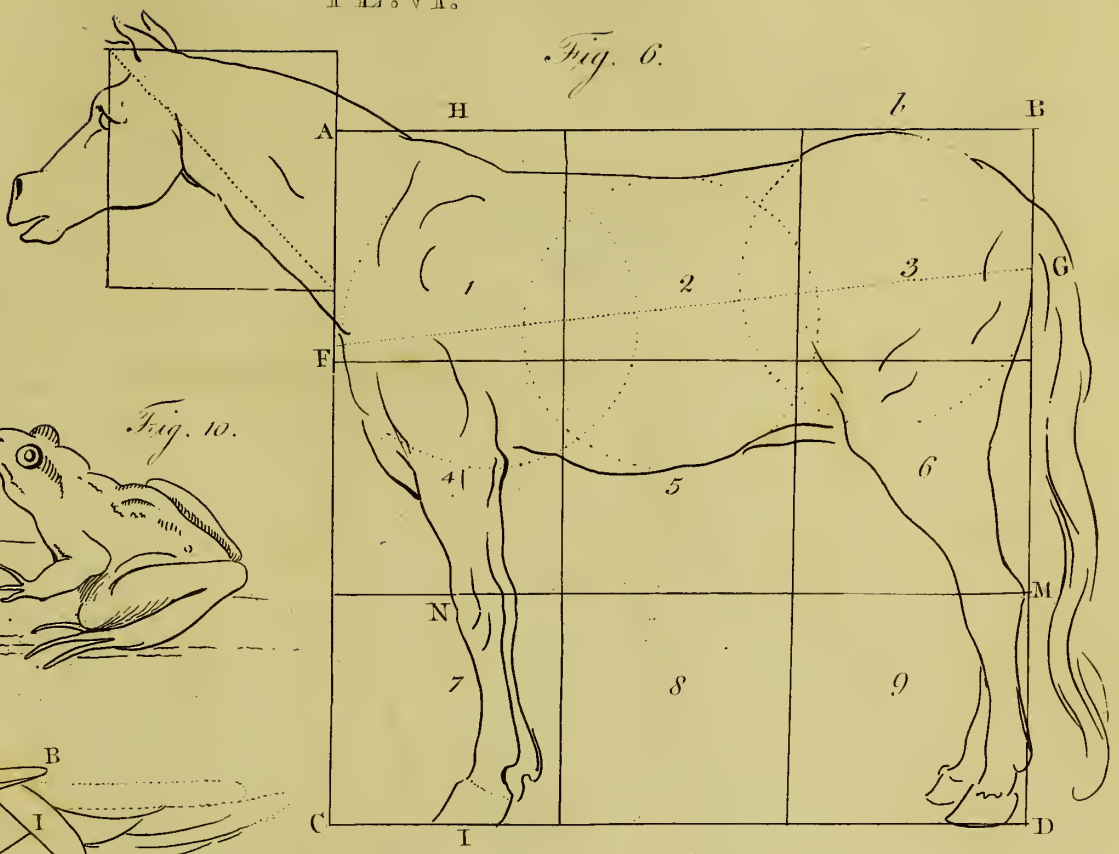


Fig. 8.

T. Kirk sculp.

PL. VI.

Fig. 6.



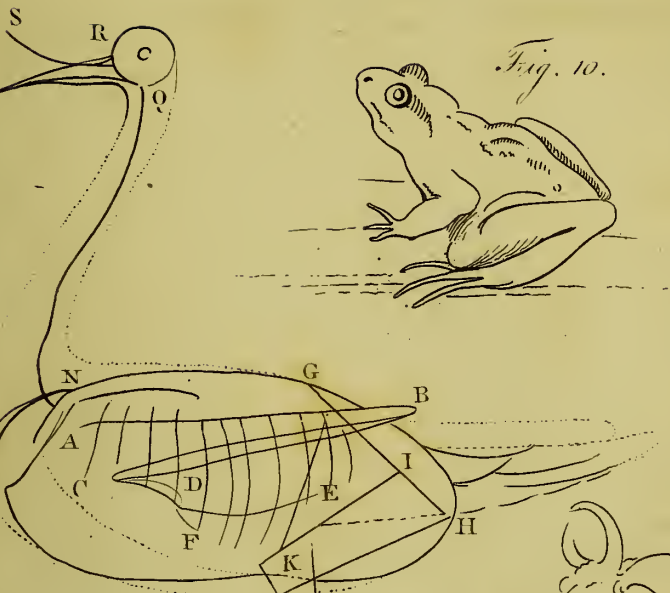


Fig. 9.

Fig. 10.

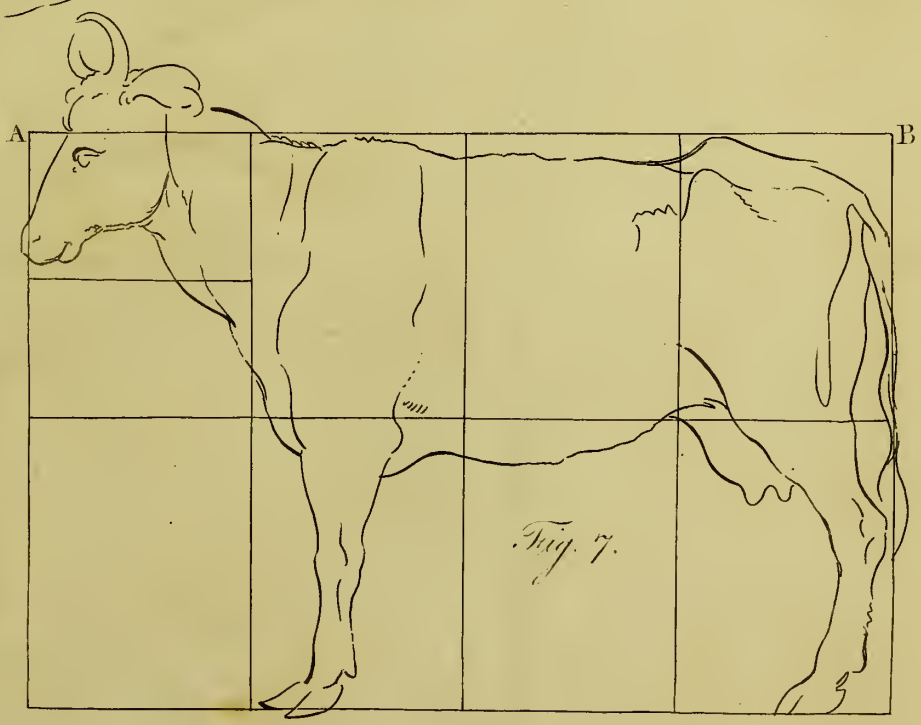
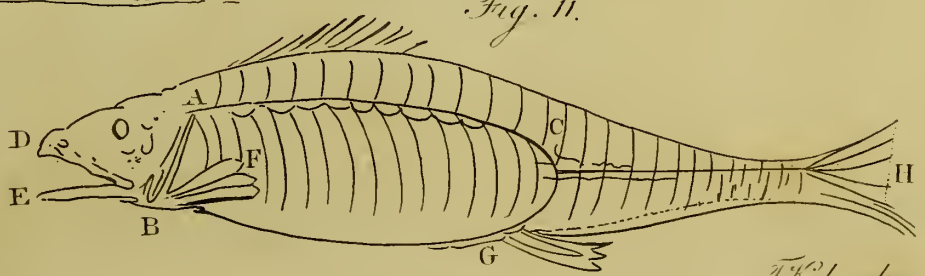


Fig. 7.

Fig. 11.

Fig. 11.



T. Kirk sculp.

PL. VIII.

Fig. 13.

Fig. 12.

T. Kirk sculp.

Plate 1th